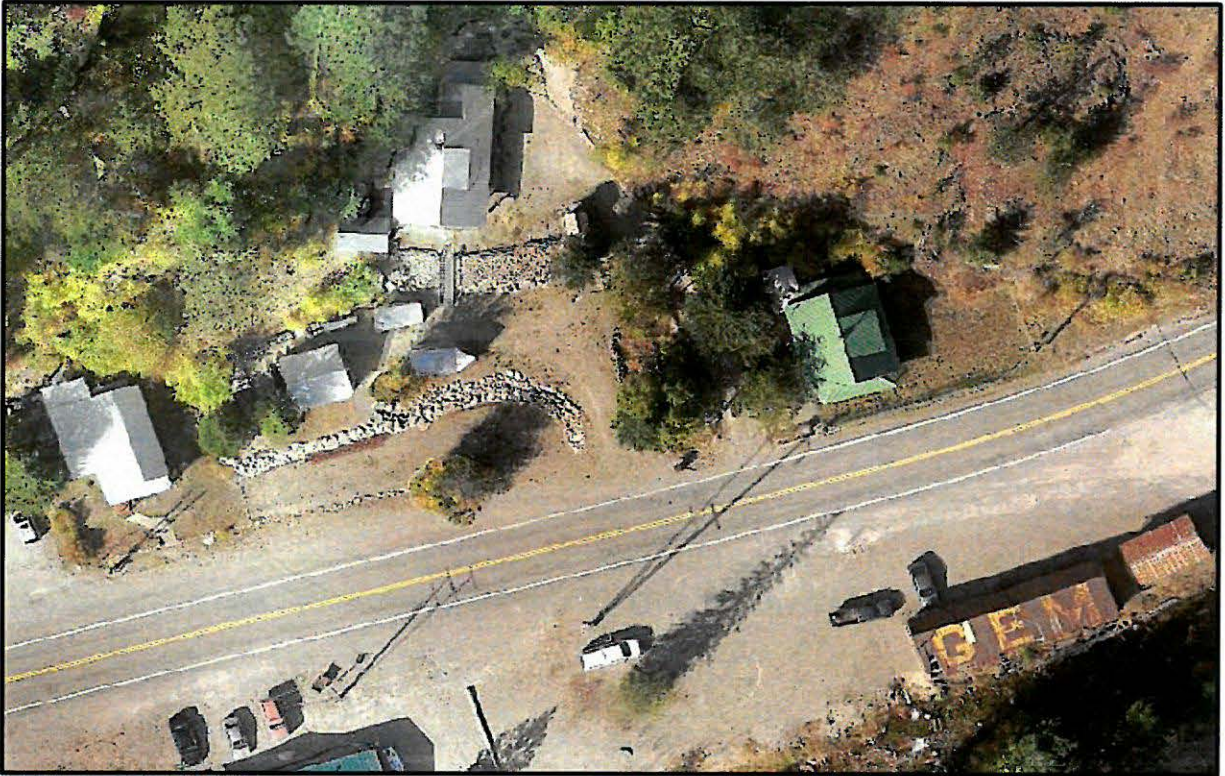


Gem Drainage Remedy Protection Project Final Design Report

Bunker Hill Mining and Metallurgical Complex Superfund Site Operable Unit 3



Prepared for: Coeur d'Alene Trust

June 3, 2019

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Acronyms and Abbreviations

Alta	Alta Science and Engineering, Inc.
ARAR	Applicable or Relevant and Appropriate Requirement
BHSS	Bunker Hill Mining and Metallurgical Complex Superfund Site
BMP	Best Management Practice
BPRP	Basin Property Remediation Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CHDPE	corrugated high density polyethylene
CMP	corrugated metal pipe
CN	curve number
CQAP	Construction Quality Assurance Plan
CWA	Clean Water Act
EC	Environmental Covenant
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FR	Federal Register
GIS	Geographic Information System
HPMP	Historic Properties Management Plan
HRA	Historical Research Associates, Inc.
ICP	Institutional Controls Program
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
ISPCW	Idaho Standards for Public Works Construction
ITD	Idaho Transportation Department
MBTA	Migratory Bird Treaty Act
MFA	Maul Foster & Alongi, Inc.
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&M	Operation and Maintenance
OU	Operable Unit
PP	Polypropylene Pipe
REC	Recognized Environmental Condition
ROD	Record of Decision
ROW	Right-of-Way
SSA	Storm and Sanitary Analysis
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
THPO	Tribal Historic Preservation Office

Trust	Coeur d'Alene Trust
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Units

cfs	cubic feet per second
ft	feet
in	inches
LF	linear feet

Section 1 Introduction

1.1 Purpose

This report presents the final design of the Gem Drainage Remedy Protection Project located within the Bunker Hill Mining and Metallurgical Complex Superfund Site (BHSS) Operable Unit 3 (OU3) in the community of Gem, Idaho (Figure 1 – Site Location Map). Previous remedial actions were conducted in OU3 that included the installation of clean soil caps and barriers to reduce human exposure to contaminated soils. The intent of the Gem Drainage Remedy Protection Project is to enhance the long-term protectiveness of the human health remedies that are vulnerable to erosion and recontamination.

This Final Design Report was prepared consistent with the Successor Coeur d'Alene Custodial and Work Trust (Trust) Implementation Framework and Statement of Work for Remedial Design, Remedial Action, and Long-Term Operation, Maintenance, and Monitoring (USEPA, 2017) and with the 2016 Basin Remedy Protection Remedial Design Work Plan (MFA, 2016). The report was prepared pursuant to the *Interim Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River* (USEPA, 2012). This report was developed following applicable United States Environmental Protection Agency (USEPA) guidance documents.

Authorization to proceed with the construction of the Gem Drainage Remedy Protection Project will occur subsequent to USEPA review of the final design. The bidding and construction documents used to procure a construction contractor and implement the selected remedy are included under a separate cover. Long-term Operation and Maintenance (O&M) of the remedy will be provided by the owner of 3475 Burke Road and Shoshone County in accordance with an Interagency Cooperative Agreement when construction is completed, consistent with project designs.

1.2 Scope

The Gem Drainage Remedy Protection Project Final Design Report documents the design criteria and presents the basis of design. The USEPA requested an evaluation and design of Gem Drainage due to localized flooding events and extensive damage to prior remedies. Specifically, flooding from Gem Drainage caused a portion of the private driveway from 3475 Burke Road to wash away and spill onto the roadway, thus necessitating action from the USEPA. This report presents a design that builds on the conceptual design of Alternative 3 presented in the Pre-Design Memorandum (Alta, 2018).

1.3 Project Overview

Gem Drainage is an identifiable but unnamed channel that drains 162 acres. The project area begins just downstream from the bottom of the drainage directly northeast of 3475 Burke Road, and continues downhill for approximately 295 linear feet (LF), crossing both the Burke-Canyon Creek Road and 3476 Burke Road towards Canyon Creek. The roadway slopes towards the southwest at an approximate 3 percent grade with multiple residential properties located on both sides of the road. The privately-owned lot on the south side of the roadway (3476 Burke Road) does not currently contain buildings.

The project involves rerouting and upsizing the existing drainage pipe alignment through the installation of two new manholes and replacing open channel flow through 3475 Burke Road with pipe. Disturbed areas such as the roadway, empty lot, and land features will be rebuilt,

reset, and/or resurfaced following the installation of the new pipe alignment in order to restore them to their original states and repair barriers to contamination.

1.3.1 *Changes from the Design Alternative Described in the Pre-Design Memorandum*

Alternative 3 proposed in the Pre-Design Memorandum (Alta, 2018) included replacement of the existing conveyance system along its entire length. This included the installation of a separate pipe network with four connecting sections between a set of three manholes. Replacement of the existing inlet structure was also proposed.

Due to further investigation into the existing hydrology and updated survey data, four changes have been made to further refine the design alternative. Key features included in this final design that are different or in addition to features presented in the Gem Drainage Pre-Design memorandum include:

- Three manholes have been reduced to two, with the alignment of the system being repositioned to collect water from the existing culvert.
- No catch basin will be added near the end of the driveway.
- Restoration of the driveway for 3475 Burke Road to pre-washout levels and filling in of the existing drainage ditch.
- Armoring around inlet and outfall structures.

Section 2 Background

The BHSS encompasses a large geographic area that includes several communities ranging in population from a few hundred to a few thousand individuals. The BHSS currently includes three Operable Units (OUs): OU1 – “Populated Areas”, OU2 – “Non-Populated Areas”, and OU3 – “The Basin.” OU1 and OU2 are located in the portion of the site known as the Bunker Hill “Box.” The Basin consists of the mining-contaminated areas in the Coeur d’Alene Basin outside of OU1 and OU2, primarily the floodplain and river corridor of the Coeur d’Alene River (including Lake Coeur d’Alene) and the Spokane River, as well as areas where mine wastes have come to be located as a result of their use for road building or for fill and construction of residential or commercial properties. Spillage from railroad operations also contributed to contamination across the Basin.

The human health remedial strategy established and implemented at the BHSS involves removal and replacement of contaminated surface soils and wastes, and establishing a network of barriers to contain sub-surface contamination. The barrier network includes several square miles of durable surfaces consisting of asphalt, concrete, and structures, as well as less-durable caps of clean soil, gravel, and vegetation.

This barrier remedy strategy adopted for the clean-up requires the communities to live interactively with large volumes of contamination in perpetuity. As a result, sustaining these barriers is critical to the long-term success of this remedy. Inadequate performance of barriers could result in elevated blood lead levels in children, pregnant women, and other residents.

2.1 Purpose and Need for the Project

Stormwater drainage and localized flooding issues due to high runoff events provide numerous risks to the permanence of the existing human health remedies. In particular, risks to the

barriers are associated with the following discrete threats: i) water containing contaminated sediment flooding remediated or “clean” areas, ii) storm water causing scouring (erosion) of barriers, and iii) contaminated sediment being mobilized and carried into the communities by runoff and deposition. Such risks are associated with failure of an undersized drainage system and as a result of flooding in areas with no existing stormwater management systems.

Several properties in or within the vicinity of the project area are at risk from stormwater runoff, scour, and deposition of contaminated sediment. In particular, the lack of capable stormwater infrastructure poses a threat to the permanence of in-place human health remedies and surface features. Extensive damage has already been done to in-place remedies due to flooding; therefore, there is a need to prevent additional flooding damages from occurring again in the area.

2.2 Project Authorization

The design presented in this report was developed by the Trust at the direction of USEPA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, Section 104, Public Law 99-499, 42 USC 9601 et seq.

The Gem Drainage design presented in this report is consistent with the preferred alternative identified in the Pre-Design memorandum (Alta, 2018). The design alternative provides protection of human health and the environment by enhancing barrier protectiveness and permanence. This final design is authorized by the USEPA.

Section 3 Existing Conditions

This section provides a discussion of the existing conditions at the Gem Drainage Remedy Protection project site. The following sections discuss the existing drainage systems; the property owners within the watersheds and other potentially impacted property owners; impacts to utilities, wetlands, and threatened and endangered species; previous remedial actions in the area; and recognized environmental concerns.

3.1 Existing Drainage Infrastructure

The area of analysis focuses on the existing drainage infrastructure identified along an approximate 325 linear foot segment of 3475 Burke Road's driveway and across Burke-Canyon Creek Road towards Canyon Creek. An unnamed drainage flows from the steep, partially forested hillsides north of Burke-Canyon Creek Road and drains a total of 162 acres (Figure 2 - Existing Conditions Map). The majority of the drainage collects north and slightly east of 3475 Burke Road and flows southward.

The existing drainage infrastructure at the site consists of a series of culvert sections which convey the channelized drainage flow to an open channel and then underneath Burke-Canyon Creek Road before the drainage exits into Canyon Creek. The intake consists of a concrete structure with a wooden grate on grade to catch medium to large debris and is intended to intercept runoff from the hillside. The drainage then enters the first culvert section (18-inch diameter corrugated metal pipe [CMP]) where it continues in the southwest direction towards the pond. The culvert passes under the pond and connects with a newer 18-inch corrugated high density polyethylene (CHDPE) culvert making a 20-degree bend to the east. At the connection there is a small opening that collects overflow from the pond. The newer 18-inch CHDPE culvert continues until it daylights at the open channel inlet, roughly parallel to and west of the top of the driveway. After exiting the first pipe section, the drainage flows through a

heavily vegetated and confined open channel section. While the open channel dimensions vary, the system was modeled as a channel that is approximately 4 feet wide at the top, 2 feet wide at the bottom, and approximately 1 foot deep. The channel flows in the southern direction and along the bottom edge of the wall. The second pipe section, an 18-inch diameter CMP, begins at the other end of the open channel, continues under Burke-Canyon Creek Road, and appears to slightly bend to the west approximately 55 linear feet from the roadway as it crosses the empty lot (3476 Burke Road) before the flow discharges into Canyon Creek through an exposed section of pipe several feet above the creek.

3.2 Property Ownership

The project area consists of two privately owned properties (see Figure 3 – Property Ownership Map). Surveying and design field work was conducted both within the public right-of-way (ROW) and on private property. Access agreements were obtained for both properties and are presented in Appendix A. Environmental covenants (ECs) for permanent structures on private property will be obtained prior to construction. Based on the pre-final design, up to two ECs may be needed. Table 1 below lists the most likely properties where permanent features will be installed. Property research has been conducted during the final design to verify ownership and existing easements for these properties. Work to be performed under Burke-Canyon Creek Road will occur within a ROW, managed by the Idaho Department of Transportation (ITD).

Table 1. Potential Properties with Permanent Features to be Constructed

Project Component	Parcel Number	Owner	Existing Easements or other ROWs	EC to be Obtained
Upper Storm Drain System (north of Burke-Canyon Creek Road)	O17010020200	(b) (6)	Unknown	Yes
Lower Storm Drain System (south of Burke-Canyon Creek Road)	O1701005014A	(b) (6)	Unknown	Yes

3.3 Utilities

Utility research performed for this design included incorporating Geographic Information System (GIS) data, survey field research, and available record drawing information. The research indicated that the only buried utilities in the vicinity of the project are, but may not be limited to, private water lines and underground water storage tanks.

A “one-call” utility locate for design was performed. No public utilities were identified.

Two tailings lines that flow out of the Star Mine and Mill Site complex from Burke, Idaho and the Gem Mine do exist at the site. These lines travel along the southern-most edge of Burke-Canyon Creek Road. The Gem tailings line has been located, but the Star tailing line has not. During construction, potholing will be required by the contractor to identify the location of the Star tailings line.

3.4 Ecological Evaluation

Alta Science & Engineering, Inc. (Alta) performed an ecological evaluation of the Gem Drainage Remedy Protection project area on October 17, 2018 (attached as Appendix B). The evaluation

covers the overall area identified on Figure 1, and focuses on specific locations where work is proposed. Based on the findings, no ecological mitigation measures are anticipated.

3.5 Previous CERCLA Remedial Actions

The proposed remedy protection project crosses private property that has been previously remediated (see Figure 4 – Remediated Properties Map), though contaminated materials from “unmaintained” areas and under existing asphalt will be excavated. There is also potential of unearthing contaminated material while repairing damaged remedy barriers. The residential properties adjacent to the project are part of the remedial action for OU3 of the BHSS. The OU3 ROD was published in 2002 (USEPA, 2002) and amended in 2012 (USEPA, 2012). Idaho Department of Environmental Quality (IDEQ) has implemented the Basin Property Remediation Program (BPRP) in the Basin as the main component of the selected human health remedy for OU3. Figure 4 shows the properties remediated as part of OU3 in the project vicinity. The completed remedy for these properties typically consists of a 12-inch layer of clean soil over a separation fabric to serve as a protective barrier to remaining contaminated soils. Remediated and unremediated areas that are impacted during construction shall have barriers installed in accordance with the *Bunker Hill Superfund Site Institutional Controls Program Barrier Design Criteria and Permitting Requirements* (Welch Comer, 1995).

3.6 Recognized Environmental Conditions

A report identifying Recognized Environmental Conditions (RECs) near the City of Burke is included as Appendix C. The intent of the REC report is to identify environmental conditions that may be encountered during implementation of the project. Various research methods were used to obtain information within a one-half mile buffer zone of the approximate center of the project construction site, including online database searches and input from an Environmental Data Resources, Inc. investigation. The historical environmental hazards targeted included: petroleum spills and other hazardous material spills, injection wells, underground storage tanks, and dry cleaners. The findings of the historical database search identified 3 sites within a half-mile buffer of the project. Considering the spatial information and the general topography, there were no sites identified that are likely RECs and may pose environmental impacts to the remedy protection construction project.

Section 4 Regulatory Compliance

4.1 Compliance with ARARs

This section identifies the Applicable or Relevant and Appropriate Requirements (ARARs) for the remedial action. A detailed analysis of ARARs is included in Appendix D. Sections 4.1 through 4.8 describe the means to comply with the following listed ARARs:

- Requirements set forth by Section 7 of the Endangered Species Act (ESA) (16 USC 1536).
- Requirements set forth in the Idaho Classification and Protection of Wildlife.
- Requirements set forth in Executive Order 11988 for Floodplain Management (42 Federal Register [FR] 26951, 3 Code of Federal Regulations [CFR] p. 117).

- Requirements set forth in Sections 301 (33 USC 1311) and 303 (40 CFR 130.7(b)(4)) of the Clean Water Act (CWA) relating to the discharge of storm water into waters of the United States.
- Requirements set forth in Sections 401 (33 USC 1341) and 404 (33 USC 1344) of the CWA relating to the discharge of dredged or fill materials into waters of the United States.
- Requirements set forth in the Idaho Stream Channel Alteration Rules (IDAPA 37.03.07).
- Requirements set forth in the National Historic Preservation Act (36 CFR 800) relating to the avoidance, minimization, and mitigation of adverse impacts to historic sites or structures.
- Requirements set forth in the American Indian Religious Freedom Act.
- Requirements set forth in the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq., 43 CFR 10).
- Requirements set forth in the Clean Air Act (42 USC 7401 et seq.) and the Rule for the Control of Air Pollution in Idaho (Idaho Administrative Procedures Act [IDAPA] 58.01.01) addressing dust mitigation (IDAPA 58.01.01.650-651) and lead particle emissions (IDAPA 58.01.01.205).

4.2 Permitting

Coordination with ITD has been completed due to work under a ROW. No permits will be obtained because the work is conducted under CERCLA; however, the substantive permit requirements must be met during the performance of the remedial action.

4.2.1 Institutional Controls Program

The specifications will require the selected construction contractor to secure a permit through the BHSS Institutional Controls Program (ICP). This process includes requirements to develop and follow a site control plan that is in compliance with the ICP and ensures that all construction activity prevents damage to previous remedial actions in the residential areas within and adjacent to the project.

4.3 Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) *Information, Planning, and Conservation Database* was queried to identify potential threatened or endangered species that may occur in the vicinity of the project area. One threatened species, the Canada lynx, and one proposed threatened species, the North American wolverine, were listed as potentially occurring in the project area. The Canada lynx and North American wolverine have similar habitat requirements. They both prefer high elevation boreal forests with persistent snowpack and areas with minimal human disturbance. Due to the project being currently located in a disturbed area with an elevation below the threshold that should be met for the species among other eliminating factors, it is unlikely that either species will occur in the project area.

Critical bull trout habitat is located approximately 24 miles downstream at the confluence of the North and South Fork of the Coeur d'Alene River. Construction best management practices (BMPs) will be utilized on site to minimize any impacts to bull trout and their habitat.

4.4 FEMA Floodplain Requirements

Based on the effective Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 16079C0575D (see Figure 5 – FEMA Flood Insurance Map) dated September 26, 2008, the majority of the project site lays within the 1% annual chance of flood hazard zone. Water surface elevations are not anticipated to rise due to the proposed project because modifications to the drainage system will be made without placement of additional fill in the floodplain that existed before the washout of the private driveway. The additional fill used to restore the driveway will not raise the surface beyond that of pre-washout levels, thus it is not expected to have an effect on the floodplain. The improved system will more efficiently convey water to Canyon Creek but will not increase the quantity of flow delivered. No additional analysis is necessary to meet floodplain requirements.

4.5 Clean Water Act and Idaho Stream Channel Alteration Requirements

Due to the size of the disturbed area of the project (less than one acre), the work does not need to meet the substantive requirements of the National Pollutant Discharge Elimination System (NPDES) USEPA Construction General Permit (CGP). The final design will include erosion and sediment control provisions and stormwater BMPs that will require the construction contractor to develop and follow an Environmental Protection Plan (EPP).

CWA Section 401 compliance will be accomplished through use of construction BMPs. The project will involve dredging and placement of material below the ordinary high water line of Gem Drainage, a water of the United States; therefore, it is also subject to the substantive requirements of Section 404 of the CWA. Nationwide Permit 38 authorizes “Specific activities required to affect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority.” The permit “does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.” The proposed work is being undertaken as part of a long-term cleanup plan developed for the Coeur d’Alene Basin in accordance with the requirements of CERCLA. Accordingly, the proposed work is in substantive compliance with Nationwide Permit 38 and CWA Section 404. Prior to construction, USEPA Region 10 will document the proposed project's substantive compliance with CWA Section 404.

4.6 National Historic Preservation Act

The National Historic Preservation Act requires that federal agencies follow the Section 106 review process outlined in the CFR Title 36 Part 800: Protection of Historic Properties. To meet the substantive requirements of these regulations, the Trust, Maul Foster & Alongi, Inc. (MFA), and Historical Research Associates, Inc. (HRA) in consultation with USEPA, the State Historic Preservation Office (SHPO), and the Tribal Historic Preservation Office (THPO) have developed the Cultural Resources Historic Properties Management Plan (HPMP) for the BHSS (HRA, 2014). This project will be implemented within the HPMP guidelines which include an unanticipated discovery plan describing the steps to be taken in the event that an artifact is revealed during construction. The steps include provisions to stop work, inventorying and recording the artifact, and notifications as required. The unanticipated discovery plan will be included as part of the construction contract.

4.7 Air Quality Requirements

Airborne particulate matter must be controlled at the project site during the entire construction period. Dust control and abatement will be included in the construction contract documents. The selected construction contractor will be required to comply with local ICP requirements that address dust control. The construction contractor will also be required to develop an EPP that describes provisions the contractor will employ to assure that dust does not become airborne and migrate off the project site. The plan shall require, at a minimum, the application of water to disturbed surfaces during the entire construction period. An EPP and Site Health and Safety Plan will be required to identify measures for health, safety, and convenience, and that prevent dust and minimize wind erosion.

4.8 Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.) protects all migratory bird species, while the Bald and Golden Eagle Protection Act provides protections for the species the act is named for. Contractors are encouraged to practice good stewardship and minimize impacts to flora and fauna, while performing the authorized remediation work to meet cleanup objectives. This direction is consistent with the overall goals of the Trust's statement of work.

Section 5 Design Basis

The following sections discuss and summarize the key components that relate to the methodology and characteristics of the design. Appendix E includes additional detail and supporting information for the hydrology and hydraulics calculations. Appendix E also contains all modeling methods and results for the existing infrastructure.

5.1 Hydrologic Analysis

The purpose of the hydrologic model was to predict the peak flow conditions from the contributing watersheds and provide input parameters for the hydraulic model. The hydraulic model was then used to determine the size and configuration of the proposed drainage system.

5.1.1 Methods

Hydrologic modeling of the project area watershed was conducted using the Autodesk's Storm and Sanitary Analysis 2016 (SSA) software with application of the Soil Conservation Service (SCS) Unit Hydrograph transform method and SCS Curve Number loss method. Results were verified using the SCS Technical Release 55 (TR-55) Graphical Method (NRCS, 1986) and the U.S. Geological Survey (USGS) StreamStats program. Both SSA and the SCS Graphical Method require basin characteristics as inputs, which are described in detail in Appendix E.

For analysis, the 162-acre drainage consists of one sub-basin hereby referred to as sub-basin A (shown on Figure 6 – Watershed Map). Sub-basin A was delineated using USGS topographic contour data incorporated into AutoCAD Civil 3D 2016.

During this analysis, USGS topographic data identified that the majority of the sub-basin should drain further to the north. Field observations identified that the drainage channel enters an approximately 30 foot deep, heavily vegetated, steep sided ravine and turns to the south (towards the existing Gem Drainage system). The delineation of the watershed was updated using these observations.

Additional snow melt calculations were extrapolated from data collected from the Humboldt Gulch (station ID: 535; located roughly 9,000 feet up the drainage) to account for additional snow melt runoff in the areas used for snow storage.

5.1.2 Design Flows

Calculated peak runoff rates for the project area watershed for the three methods used are summarized below in Table 2. Flood routing was not considered in the SCS Graphical method value so it cannot be directly compared to the others and is likely higher than the SSA value for that reason.

Table 2. Gem Drainage 50-Year Rain and Snowmelt Input Values (cfs)

Hydrologic Analysis Method	Sub-Basin A	Snowmelt	Total	Valid	Comments
USGS StreamStats	18.4		18.4	No	Application and accuracy of this method is not valid for the project area watershed (sub-basin A) based on watershed size.
SCS Graphical w/Snowmelt	28.2	4.5	32.7	Yes	
SSA w/Snowmelt	26.7	4.5	31.2	Yes	Selected for design

Notes: cfs = cubic feet-per-second

The SCS TR-55 Graphical Method, with snowmelt added, resulted in a peak flow value of 32.7 cubic feet-per-second (cfs). This calculation was completed as a check for the SSA results and was within approximately 1.5 cfs (4.8%).

In comparison to the other methods, the USGS StreamStats method resulted in a much lower peak runoff. As explained above in Table 2, the project area watershed (sub-basin A) is below the acceptable range of watersheds for the regression equations making the method invalid in this application.

5.2 Hydraulic Analysis

The following section summarizes the results of the hydraulic analyses and design of the Gem Drainage storm drain network.

5.2.1 Methods

Hydraulic modeling was performed utilizing two computer programs; the Federal Highway Administration (FHWA) HY-8 Culvert Hydraulic Analysis Program (HY-8) and SSA, respectively.

The intake was analyzed and designed using HY-8. Model inputs and assumptions are discussed in more detail in Appendix E. A precast concrete headwall and wingwall unit with a 24-inch Polypropylene pipe (PP) storm drain pipe was analyzed for capacity.

The storm drain pipe network was exported from AutoCAD and imported into SSA to create the model. Model results are included in Appendix E.

5.2.2 Results

With a slope of approximately 29%, the intake and 24-inch pipe were able to pass the design flow without any overtopping of the headwall.

In an iterative design process, the inlets and pipes were sized to function effectively at maximum capacity during the design storm event. The 24-inch pipes had enough capacity to convey the combined snow melt and rain event from the inlet to the outfall. More detail can be found in Appendix E.

5.3 Proposed System Design

This section summarizes the design features of the proposed pipe network and other various drainage features as part of the project. A complete explanation of the analysis and design of the features is included in Appendix E.

- One precast inlet structure with headwall and wingwalls to collect drainage into the design system.
- One 60-inch diameter slab top manhole with sump, and one 48-inch diameter slab top manhole with sump and a 36-inch lock-in lid to convey flow from inlet structure to Canyon Creek by 244 linear feet of 24-inch PP.
- Compacted stream material with two rock weirs north of inlet.
- Riprap intake armoring for open channel outfall.
- Riprap outfall armoring at Canyon Creek.
- 290 square yards of driveway restoration for 3476 Burke Road to pre-washout elevation and grade. Filling in of the existing lower drainage system on 3475 Burke Road (approximately 50 cubic yards).
- 140 square yards of gravel surface restoration.
- 48 LF of 6" perforated sock drain to collect ground water from filled channel.
- Concrete pipe anchors will be utilized on the pipe segment between the intake and MH-2.
- Concrete thrust blocks on the upstream and downstream sides of MH-1 and MH-2.

5.4 Utility Conflicts

The known subsurface utilities in the project area include two tailings lines, water storage tanks at 3475 Burke Road, and private water lines. Utilities identified on the Final Design Drawings are in approximate locations and may not identify all utilities present within the construction area. The horizontal and vertical alignment of the proposed storm drain pipe has been selected to avoid conflicts with the two existing tailings lines as much as possible. The selected contractor will be required to independently verify the location and extent of the existing utilities and protect all above-ground and below-ground utilities.

5.4.1 *Utility Location*

Unavoidable or unanticipated conflict with existing utilities along the proposed system alignment will require the relocation of some utilities. All utilities will be relocated or installed per the Idaho Standards for Public Works Construction (ISPWC).

5.5 Construction Quality Assurance

The project will follow a Construction Quality Assurance Plan (CQAP). The purpose of the CQAP is to provide procedures to ensure the project is constructed and documented in accordance to the design and regulatory requirements intended by the construction documents. The CQAP will identify roles, responsibilities, qualifications, preconstruction administrative requirements, inspections, documentation criteria, and construction acceptance criteria. Specific construction procedures, observations, sampling, testing, acceptance criteria, surveying, and seasonal closure will also be described in the CQAP.

5.6 Plans and Specifications

Construction drawings to be used for bidding and construction of the project are prepared to the final design level and are included as an attachment to this report. The drawings detail the necessary components of the system engineered to protect human health and the existing remedy based on a 50-year rain and snowmelt design storm event.

Appendix F presents an outline for the technical specifications necessary for the project's construction. The final specifications will address material and installation requirements and other responsibilities of the selected contractor that facilitate the safety of the public, environment, and surroundings. The specifications will be based on the ISPWC. Operation and Maintenance

An O&M manual has been prepared that follows the general format of O&M manuals developed by IDEQ and USEPA for other remedial actions at the BHSS. The manual includes the following sections and is attached as Appendix G:

- Remedy Description
- Guidance Statements and Design Features
- O&M Requirements and Schedules
- Unscheduled O&M Requirements
- Repair Standards and Authorization
- Equipment and Personnel Requirements
- Refinements and Modifications
- Other Considerations
- Appendices
 - Inspection Maps
 - Inspection Criteria and Repair Guidelines
 - Inspection Checklists

5.7 Engineer's Opinion of Probable Cost

The Engineer's Opinion of Probable Construction Cost for the final design is \$135,375. The construction budget that is allocated for the project should include an additional 15% contingency for unforeseen conditions and changes. This brings the total estimated cost to \$155,681 including a 15% contingency.

Details of the material quantities and unit prices supporting the estimate is provided under separate cover to the Trust. The estimate is not included as an appendix to this report to maintain confidentiality of the estimate prior to advertising for bids.

5.7.1 Cost Factors

Factors that may affect project costs during construction, whether unforeseen or as compared to traditional projects, include:

- Unforeseen weather conditions;
- Unexpected ground conditions;
- Undocumented underground utilities;
- Fluctuation in prices of raw materials; and
- Unforeseen archaeological or environmental impacts.

Section 6 References

Alta Science & Engineering, 2018. Gem Drainage Pre-Design. Prepared by Alta Science & Engineering for the Coeur d'Alene Trust.

Code of Federal Regulations Title 36: Parks, Forest, and Public Property. Part 800: Protection of Historic Properties.

Code of Federal Regulations Title 40: Protection of Environment. Part 130: Water Quality Planning and Management. Paragraph 130.7: Total maximum daily loads (TMDL) and individual water quality-based effluent limitations.

Historical Research Associates, Inc (HRA), 2014. Bunker Hill Mining and Metallurgical Complex Superfund Site Historic Properties Management Plan.

Idaho Administrative Procedures Act (IDAPA) Title 58: Department of Environmental Quality. 58.01.01: Rules for the Control of Air Pollution in Idaho.

IDAPA 37: Department of Water Resources. 37.03.07: Stream Channel Alteration Rules.

Maul Foster & Alongi, Inc. (MFA), 2016. Remedial Design Work Plan for Remedy Protection Projects in OU3: Mullan, Wallace, Osburn, and Silverton Area Projects. Prepared by Maul Foster & Alongi, Inc. for the Coeur d'Alene Trust.

Natural Resources Conservation Service (NRCS), 1986. Urban Hydrology for Small Watersheds T-55 Manual. United States Department of Agriculture: Conservation Engineering Division. June.

US Code Title 16: Conservation. Chapter 35: Endangered Species. Section 1536: Interagency Cooperation.

US Code Title 33: Navigation and Navigable Waters. Chapter 26: Water Pollution Prevention and Control. Subchapter III: Standards and Enforcement. Section 1311: Effluent Limitations.

US Code Title 33: Navigation and Navigable Waters. Chapter 26: Water Pollution Prevention and Control. Subchapter IV: Permits and Licenses. Section 1341: Certification.

US Code Title 33: Navigation and Navigable Waters. Chapter 26: Water Pollution Prevention and Control. Subchapter IV: Permits and Licenses. Section 1344: Permits for Dredged or Fill Material.

US Code Title 42: The Public Health and Welfare. Chapter 85: Air Pollution Prevention and Control. Subchapter I: Programs and Activities. Part A: Air Quality and Emission Limitations. Section 7401: Congressional Findings and Declaration of Purpose.

US Environmental Protection Agency (USEPA), 2002. Record of Decision (ROD) Bunker Hill Mining and Metallurgical Complex Operable Unit 3. September.

USEPA, 2012. Interim Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Bunker Hill Metallurgical Complex. August.

USEPA, 2017. Successor Coeur d'Alene Custodial and Work Trust, implementation framework and statement of work for remedial design, remedial action, and long-term operation, maintenance, and monitoring. Coeur d'Alene Basin Operable Unit 3, Bunker Hill mining and metallurgical complex Superfund site.

Welch, Comer, and Associates, 1995. Bunker Hill Superfund Site, Institutional Controls Program; Barrier Design Criteria & Permitting Requirements.

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Figures

Figure 1. Site Location Map

Figure 2. Existing Conditions Map

Figure 3. Property Ownership Map

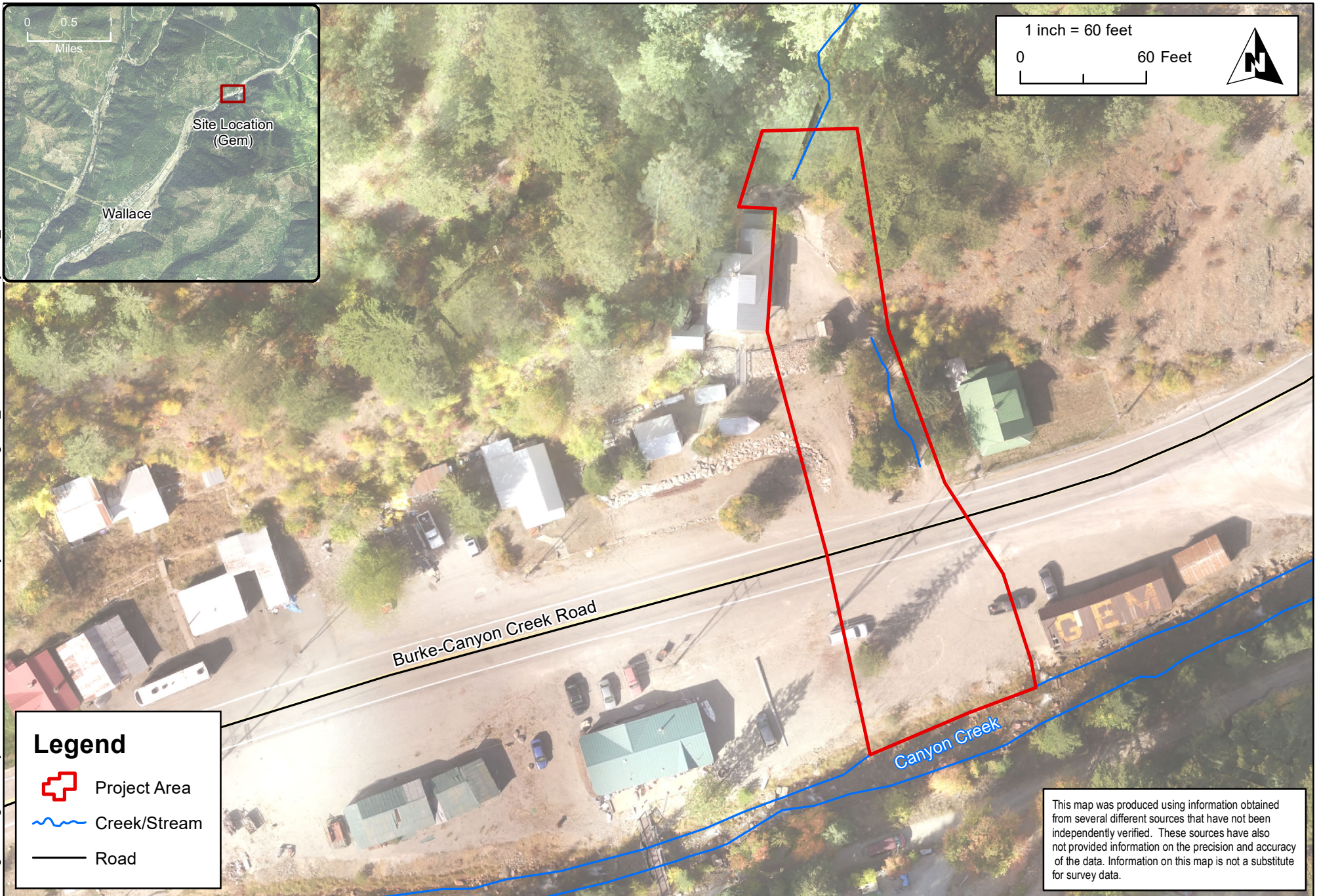
Figure 4. Remediated Properties Map

Figure 5. FEMA Flood Insurance Rate Map.

Figure 6. Watershed Map

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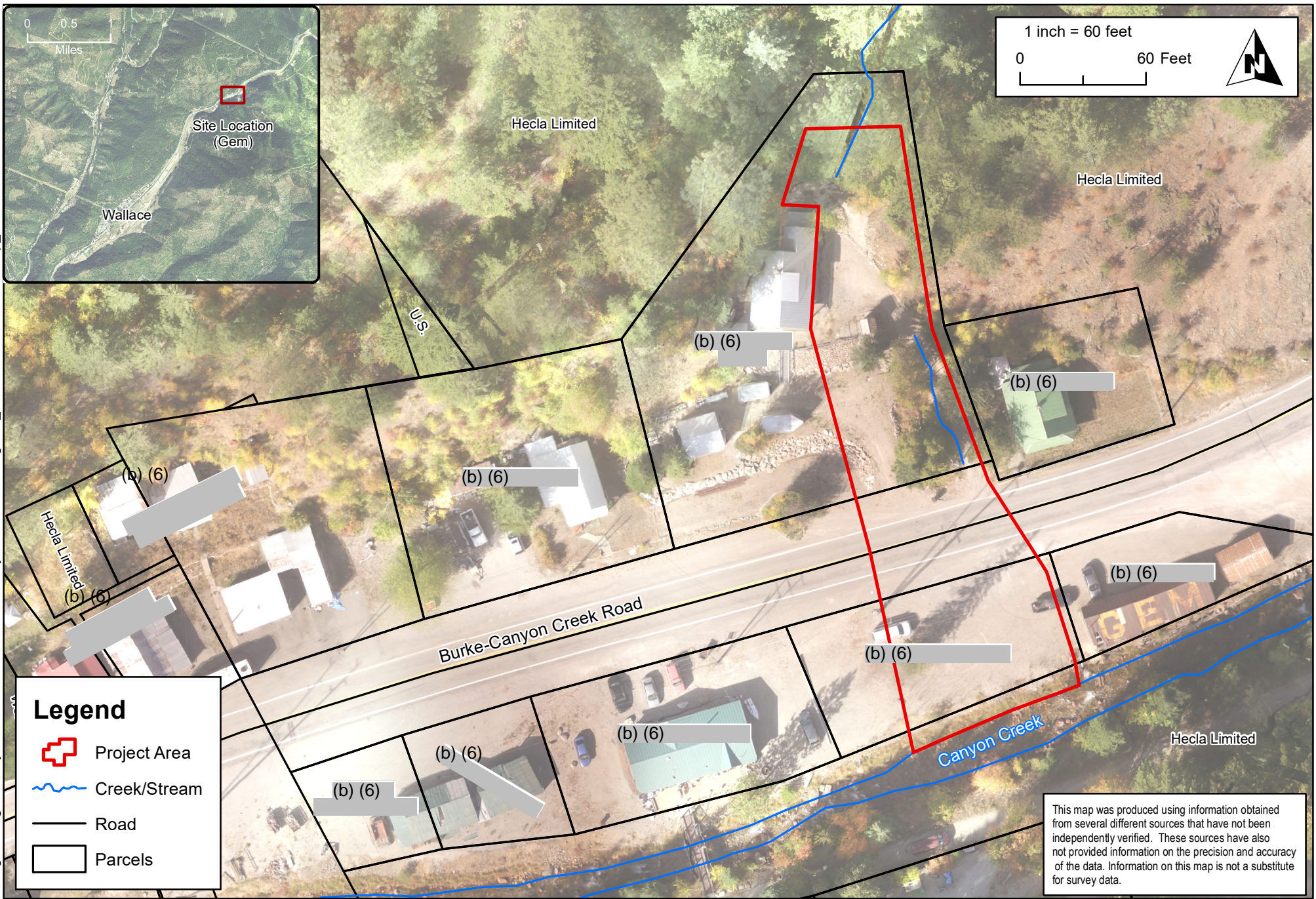
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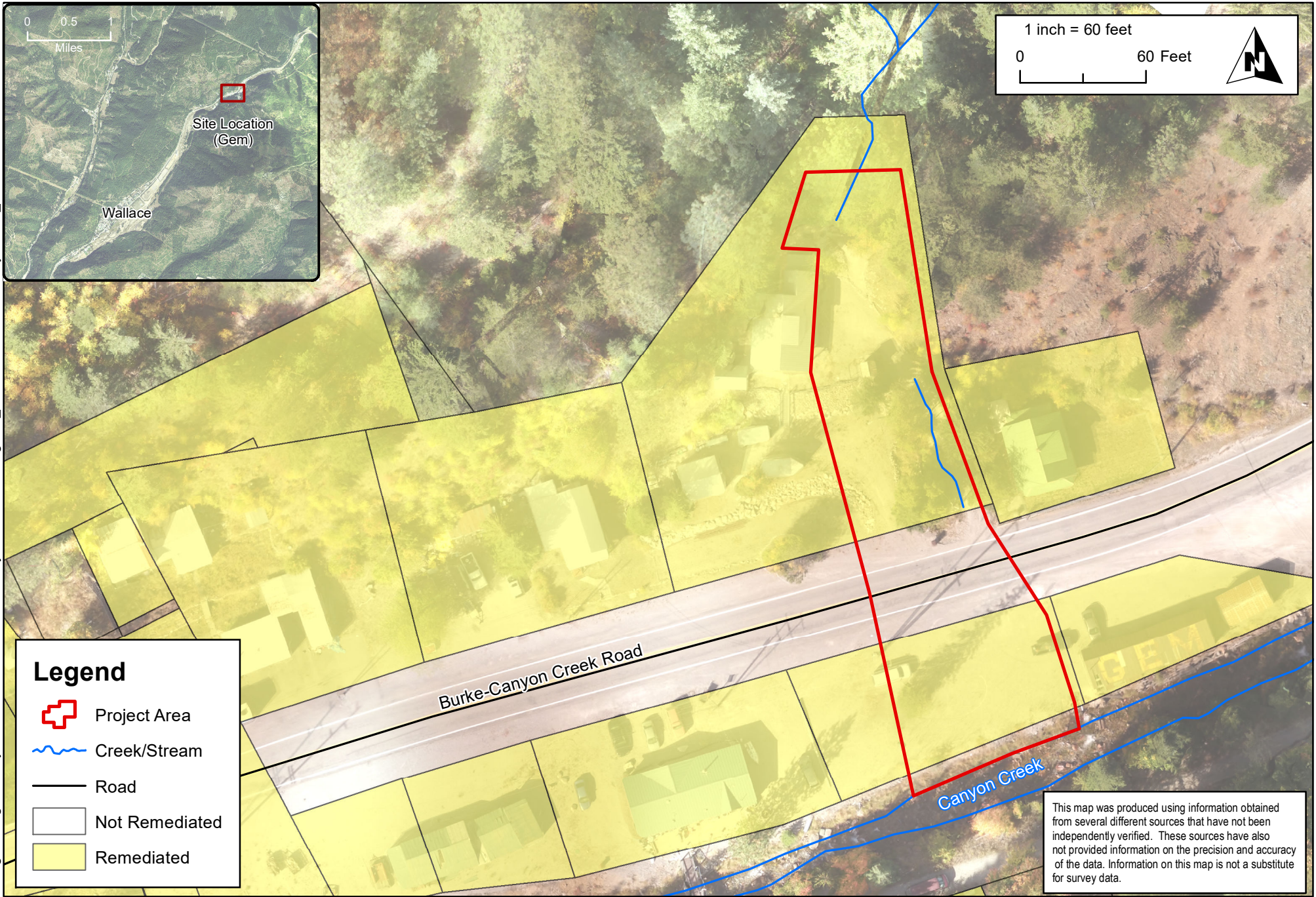
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PRINT DATE	Mar 27, 2019
PROJECT NUMBER	18014-07-02

REQUESTOR	R. Satichtchev
PROJECT MANAGER	D. Pfeifer
CARTOGRAPHER	B. Rollins

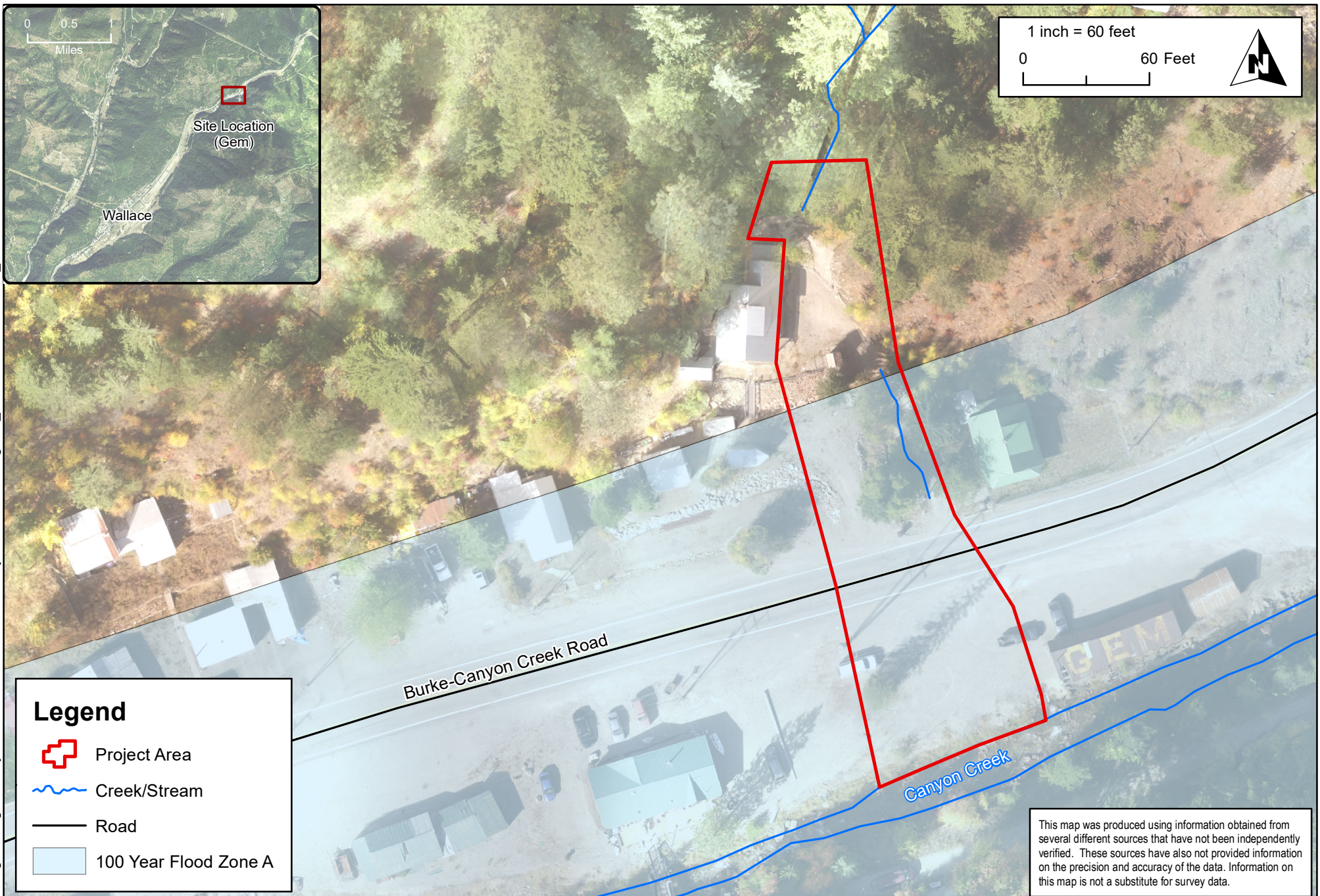
PROJECT NAME	Gem Drainage Remedy Protection Shoshone County, ID
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Figure 4

Remediated Properties Map

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This map was produced using information obtained from several different sources that have not been independently verified. These sources have also not provided information on the precision and accuracy of the data. Information on this map is not a substitute for survey data.



PRINT DATE
Mar 27, 2019

PROJECT NUMBER
18014-07-02

REQUESTOR
R. Satichtchev

PROJECT MANAGER
D. Pfeifer

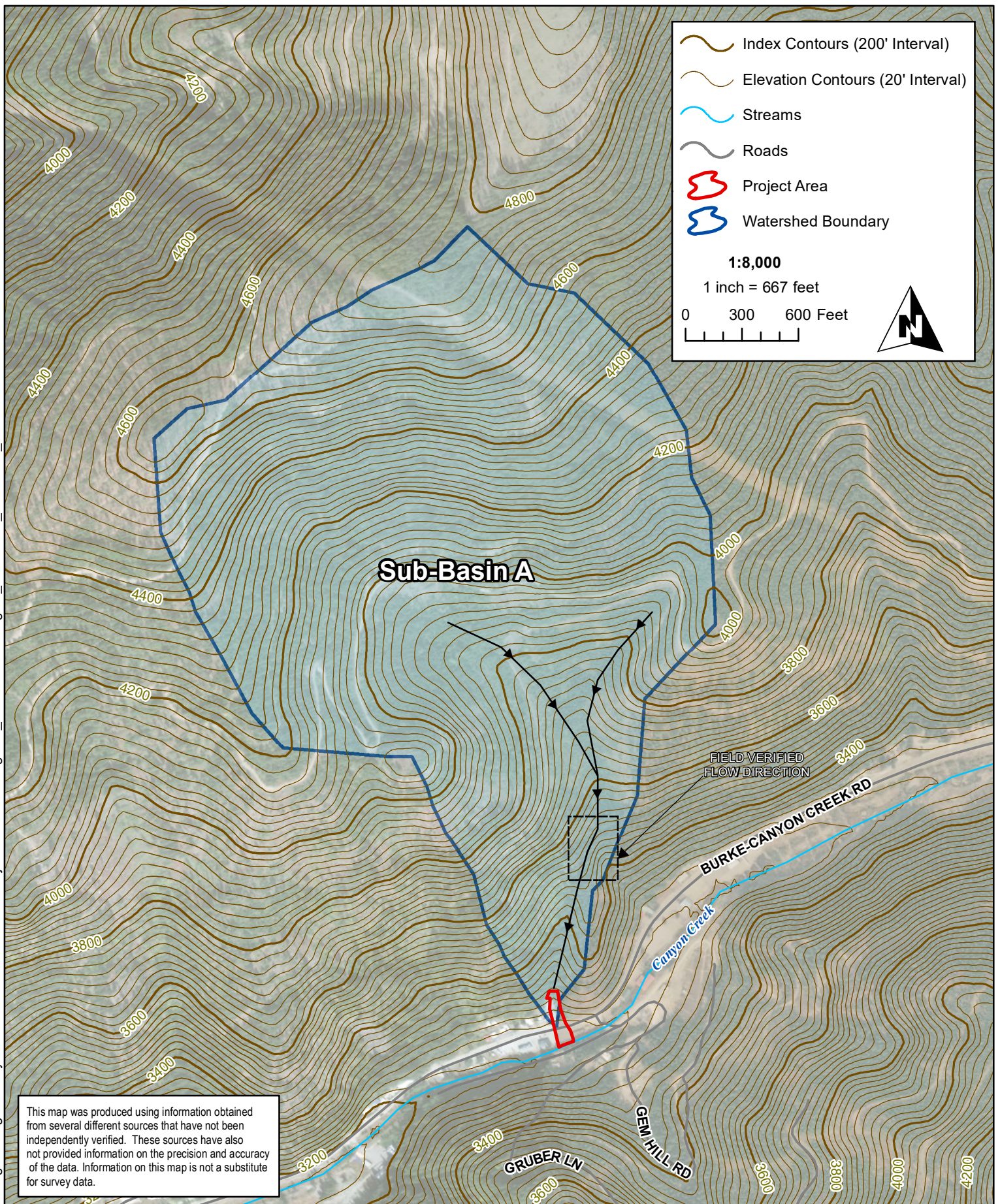
CARTOGRAPHER
B. Rollins


PROJECT NAME
**Gem Drainage
Remedy Protection
Shoshone County, ID**

**Figure 5 FEMA Flood Insurance
Rate Map - FIRM 16079C575D**

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	PRINT DATE Mar 28, 2019	REQUESTOR R. Satichtchev	PROJECT NAME Gem Remedy Protection Project	Watershed Boundary	Figure 6
	PROJECT NUMBER 18014-07-02	PROJECT MANAGER D. Pfeifer			
		CARTOGRAPHER B. Bailey/B. Rollins			

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Appendix A
Access Agreements

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P.O. Box 570 • Kellogg, Idaho 83837 • (208) 783-0222

CONSENT FOR ACCESS TO PROPERTY

Name: (b) (6)

(b) (6)

(b) (4)

Property Address:

(b) (6)

Wallace, ID 83873

Parcel:

O1701005014A

I consent to officers, employees, and authorized representatives of the Successor Coeur d'Alene Custodial and Work Trust (Coeur d'Alene Trust), Idaho Department of Environmental Quality (IDEQ), Panhandle Health District (PHD), U.S. Environmental Protection Agency (EPA), their representatives, personnel acting at their request and their respective contractors to conduct activities as they relate to review and investigation of previously completed remedial action construction and drainage features at the above described property.

I realize that these actions are undertaken pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), 42 U.S.C § 9601, et seq.

I understand that the term of this consent is valid from the date this agreement is signed through December 31, 2018.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

Owner Signature:

(b) (6)

Signature of Owner (or designee)

Date Signed

(b) (6)

Printed Name(s) of Owner(s) of Designee(s)

Coeur d'Alene Trust Signature:

Signature of Coeur d'Alene Trust

Title

Date Signed

(b) (6)

Owner's Mailing Address

(b) (6)

Owner's Telephone Number



P.O. Box 570 • Kellogg, Idaho 83837 • (208) 783-0222

CONSENT FOR ACCESS TO PROPERTY

Name: (b) (6)
(b) (6)
Coeur d'Alene, ID 83814

Property Address:
(b) (6)
Wallace, ID 83873

Parcel:
O17010020200

I consent to officers, employees, and authorized representatives of the Successor Coeur d'Alene Custodial and Work Trust (Coeur d'Alene Trust), Idaho Department of Environmental Quality (IDEQ), Panhandle Health District (PHD), U.S. Environmental Protection Agency (EPA), their representatives, personnel acting at their request and their respective contractors to conduct activities as they relate to review and investigation of previously completed remedial action construction and drainage features at the above described property.

I realize that these actions are undertaken pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), 42 U.S.C § 9601, et seq.

I understand that the term of this consent is valid from the date this agreement is signed through December 31, 2018.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

Owner Signature:

(b) (6)

Signature of Owner (or designee)

5-18-18

Date Signed
(b) (6)

Printed Name(s) of Owner(s) of Designee(s)

Coeur d'Alene Trust Signature:

Jim Lindsay

Signature of Coeur d'Alene Trust

Program Manager

Title

May 21, 2018

Date Signed

(b) (6)

Owner's Mailing Address
(b) (6)

Owner's Telephone Number

Appendix B

Ecological Evaluation

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MEMORANDUM

To: Derek Forseth, Alta Science & Engineering, Inc., Kellogg
From: Roman Satichtchev, Alta Science & Engineering, Inc., Kellogg
Tarita Harju, Alta Science & Engineering, Inc., Kellogg
Date: October 22, 2018
Job Code: 19010-30-10
Subject: Ecological Review for Gem Drainage Remedy Protection Project

This memorandum describes the findings of an ecological evaluation for the Gem Drainage Remedy Protection Project in Gem, Idaho. To complete this evaluation, a field visit was conducted on October 17, 2018. Topics addressed include: threatened and/or endangered species ramifications, presence of wetlands, a qualitative survey of biota primarily focused on fish, and a review of habitat suitable for migratory bird nesting.

Section 1 Project Area Description

The field visit encompassed the area within the proposed project boundary, as shown on the project boundary map (Attachment A). This project consists of installing several culverts and performing surface repairs along an updated water conveyance system. Canyon Creek is the only body of water that will be directly affected by the project as all the collected runoff will be discharged into the creek.

Section 2 Threatened and/or Endangered Species

The *Information, Planning, and Conservation System* (IPaC database) is a U.S. Fish and Wildlife Service online database that can be used during the planning stages of a project to identify potential threatened or endangered species in a specified area. The database was queried on October 2, 2018 and one threatened species, the Canada lynx, and one proposed threatened species, the North American wolverine, were identified as potentially occurring in the project area. The Canada lynx prefer densely-covered boreal forests, generally above 4,000 feet in elevation, with persistent snowpack and areas with minimal human disturbance. In addition, Canada lynx inhabit forests with at least one hectare in area dominated by subalpine fir (*Abies lasiocarpa*) and/or Englemann spruce (*Picea engelmannii*). The project area's elevation is below 3,300 feet. Other habitat requirements such as persistent snowpack, minimal human disturbance, a densely-covered forest, and >one-hectare patches of forest dominated by subalpine fir or Englemann spruce are also missing from the project area. These characteristics make it highly unlikely for Canada lynx to occur in the area. The North American wolverine prefers cooler weather that permits adequate snow to persist into late spring, and elevations above 7,200 feet. In addition, North American wolverine tend to inhabit whitebark pine communities in the winter. None of these conditions are met in the adjacent forest or the project site itself. The project area does not include designated critical habitat for the Canada lynx and there are currently no critical habitat designations for the North American wolverine.

The Coeur d'Alene River has designated bull trout (*Salvelinus confluentus*) critical habitat approximately 24 miles downstream of the project area at the confluence of the South and North Fork of the Coeur d'Alene River. We recommend using project Best Management Practices (BMPs) that will ensure that the critical habitat is not compromised (to be determined by the design team).

Section 3 Wetlands

The *National Wetlands Inventory* (NWI) is an online database that is commonly used as an indicator for the presence of wetlands. Its data is intended as guidance only and should be field-verified. We queried the NWI on October 2, 2018 which did not identify wetland areas within the project boundary.

Three conditions must be met for an area to be considered a wetland: 1) it must have a dominance of hydrophytic vegetation, 2) it must have evidence of wetland hydrology, and 3) it must have hydric soils. Each of these conditions is fully defined and described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE, 2010). Based on the field review, there is no indication that wetlands are present in the project area and no areas within the project area exhibit characteristics that indicate the need for wetland delineation.

Section 4 Biota (Including Fish)

StreamNet is an online fish database that contains a variety of information on fish species, distribution, and stream features. For remedy protection projects, the database query includes fish distribution, fish barriers, and protected areas. *StreamNet* was queried on October 2, 2018 and identified Westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) as being present in Canyon Creek. The database also indicated a water diversion barrier extending the entire length of Canyon Creek as a potential fish barrier for cutthroat trout due to mining activity that has leached high amounts of metals into the creek.

Vegetation observations were made at several locations within the project area and vegetation was similar at all sites. Species included trees, shrubs, and forbs/grasses, including: Grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), common snowberry (*Symphoricarpos albus*), rocky mountain maple (*Acer glabrum*), alder (*Alnus* spp.), common horsetail (*Equisetum arvense*), miscellaneous upland grasses and herbs, landscaping forbes, shrubs, and trees. Several mature trees are present either within or immediately adjacent to the project area including grand fir, Douglas-fir, and maple (*acer* spp.).

Section 5 Migratory Bird Habitat

The approximate migratory bird nesting season for the Silver Valley is April 1 - August 1. Potential migratory bird habitat was observed on and around the residential property in addition to the empty lot in the lower part of the project area. The project work area located on the paved road and on the driveway is not potential habitat for migratory bird nesting, however the riparian area threading down the mountainside may be potential habitat. Contractors are encouraged to practice good stewardship and minimize impacts to flora and fauna, while performing the authorized remediation work to meet cleanup objectives. This direction is consistent with the overall goals of Coeur d'Alene Trust's statement of work.

Field evaluation for potential migratory bird nesting habitat was limited to areas where active construction is planned.

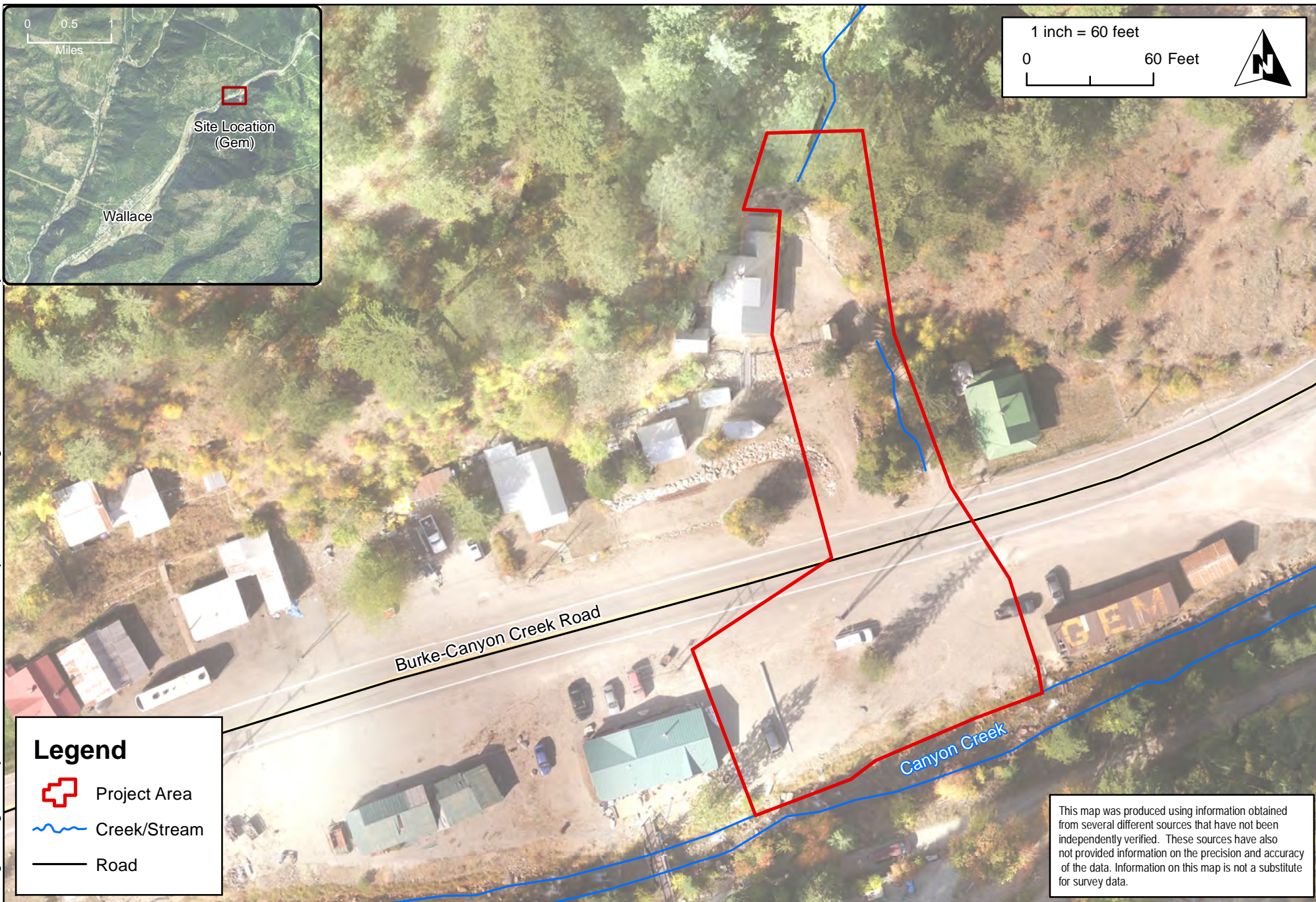
Section 6 References

U.S. Army Corps of Engineers (USACE), 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*.

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Attachment A
Project Boundary Map

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Appendix C

Recognized Environmental Conditions

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MEMORANDUM

To: Duncan Pfeifer, Alta, Kellogg
Derek Forseth, Alta, Kellogg

From: Rachel Gibeault, Alta, Boise

Date: December 13, 2018

Job Code: 18014-07-02

Subject: **Potential Recognized Environmental Conditions near the Proposed Gem Drainage Remedy Protection Project in Gem, Idaho**

Section 1 Introduction

The goal of this memorandum is to provide recognized environmental condition (REC) information on properties in the vicinity of the remedy protection work near the Gem Drainage Remedy Protection Project construction area in Gem, Idaho. This memorandum identifies sites with known environmental conditions and evaluates whether such properties have the potential to impact the Gem Drainage Remedy Protection Project. Any properties that have the potential to impact the project area would be identified as a REC for the remedy protection construction area, consistent with the definition of this term contained in the *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E1527-13). Table 1 includes all the identified sites from the research, and Figure 1 shows the identified sites for this project. Letter designations for the sites (A through D) are provided and used throughout this document for clarity and easy identification in comparison to Figure 1 and Table 1.

Section 2 Area Considerations

2.1 Institutional Controls Program

The Bunker Hill Mining and Metallurgical Complex Superfund Site (BHSS) was listed on the National Priority List in 1983 due to widespread metals contamination from nearly a century of mining in the South Fork Coeur d'Alene River (SFCDR) valley. The BHSS is divided into Operable Units (OUs) 1, 2, and 3 for manageable cleanup. The City of Gem is located in OU 3, also known as the "Basin," which consists of the mining-contaminated areas in the Coeur d'Alene Basin outside of OU 1 and OU 2. The "Box," which contains OU 1 and OU 2, has widespread contamination from mine tailings, emissions from the Bunker Hill smelter complex, and blowing dust from tailings piles and other barren areas. These areas are primarily the floodplain and river corridor of the Coeur d'Alene River (including Coeur d'Alene Lake) and the Spokane River, but also include mine and mill sites and residential or commercial properties where mine wastes have been used for road building or for fill and construction. There is extensive heavy metals contamination in groundwater and surface water because of historical mining activities and continued leaching of metals from mine and mill wastes.

(b) (4)



Figure 1. The Frisco Mill at Gem, Idaho, in 1907. This early view of Gem shows the cramped conditions under which the town was built (<https://westernmininghistory.com/towns/idaho/gem/>).

Remedial Investigation and Feasibility Studies and associated Health and Risk Assessment activities identified soils and dusts as the principal sources of lead poisoning among young children at the BHSS. The cleanup strategy incorporated in the Records of Decision issued in 1991 and 1992 for the Box, and 2002 for the Basin by the U.S. Environmental Protection Agency (USEPA) relies on partial removal and capping and containment of these soils. The clean caps or barriers serve to prevent both direct contact with and migration of contaminants.

An Institutional Controls Program (ICP) has been promulgated through local ordinances to monitor and certify barrier integrity. The ICP is designed to regulate construction projects and long-term operations and maintenance of established remedial actions, especially contaminant barriers, within the Box and Basin. This is accomplished primarily by assuring appropriate remedial action selections, and implementation procedures and regulations are followed, to eliminate contact between contaminants and the public. The objective of ICP barrier design criteria and permitting requirements with respect to construction projects is to protect the integrity of installed barriers and maintain a system of activity controls and standards to keep migrating contaminants from impacting barriers or remediated areas. All of the properties within the vicinity of the Gem Drainage Remedy Protection Project are subject to the requirements of the ICP; however, not all have been remediated. Figure 2 shows the properties in the project

area which have had clean barriers installed through previous Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation activities.

2.2 Utilities

Generally, utility lines can provide a preferred subsurface pathway for released site contaminants. Spills from documented sites have the potential for contaminant migration along these paths of least resistance toward the proposed construction area. However, utilities are unknown and have yet to be mapped for this area.

2.3 Groundwater Flow Direction

The site-specific groundwater flow regime was not characterized for this REC memorandum. Near the remedy protection project area, Canyon Creek travels along the south side of Burke Road (Figure 2). The presumed groundwater flow direction is west toward the SFCDR following the general topography of the project area.

Section 3 Research Methods

Historical research for the surrounding area is limited to a half-mile buffer zone from the proposed remedy protection construction area boundaries. Alta used a variety of resources—documented in the following subsections—to locate documented sites within Gem.

3.1 Environmental Data Resources

Alta subcontracted Environmental Data Resources, Inc. (EDR) to search databases and lists of identified sites with RECs. The searched databases and lists are documented in the EDR Radius Map™ Report (available upon request).

3.1.1 Target Property Search

A target property search typically contains reported information on spills (petroleum and hazardous materials), hazardous incidences, injection wells, and environmental liens/institutional controls. For the proposed remedy protection construction work, target properties include parcels within or adjacent to the construction area boundary (Figure 2). EDR did not identify any sites within this search boundary.

3.1.2 Quarter-mile Search Radius

A quarter-mile radius search typically contains information on Resource Conservation and Recovery Act (RCRA) generators, underground storage tanks (USTs), and dry cleaners. EDR identified two sites within this search boundary.

- **GEM MILL SITE BUR142** at latitude 47.50884103, longitude -115.8659251 within Parcel 48N05E184950 (Site B on Figure 2 and in Table 1) – this is historically an active mine but is now inactive. Based on this information, metals are the potential hazardous materials for this site.
- **GEM No 3 BUR190** at latitude 47.50826549, longitude -115.8660012 within Parcel 48N05E184950 (Site D on Figure 2 and in Table 1) – this is historically an active mine but is now inactive. Based on this information, metals are the potential hazardous materials for this site.

3.1.3 *Half-mile Search Radius*

A half-mile radius search typically contains information on leaking underground storage tanks (LUSTs), Brownfields, voluntary cleanup programs, and other cleanup/remediation work that may have occurred on a property. EDR identified one site within this search radius.

- **FRISCO No 3 BUR191** at latitude 47.5116027, longitude -115.8590919 within Parcel 48N05E180200 (Site A on Figure 2 and in Table 1) – this is historically an active mine but is now inactive. Based on this information, metals are the potential hazardous materials for this site.

3.2 *Idaho Department of Environmental Quality*

Idaho Department of Environmental Quality (IDEQ) keeps an inventory of sites throughout the State that manage wastes or have released wastes into the environment and require remediation. This inventory is not all-encompassing; there are many sites that handled hazardous materials prior to current environmental regulations. IDEQ is continually refining its current list of remediation sites that it has tracked and/or addressed during the era of hazardous materials regulations beginning in the early 1980s.

3.2.1 *J.P. Stravens (2006) Report*

IDEQ contracted J.P. Stravens/Planning Associates, Inc. (J.P. Stravens) in 2006 to conduct a study to identify sites that may have potential for hazardous waste within Benewah and Shoshone counties. J.P. Stravens researched a number of databases to obtain information regarding potential sites that have stored, used, or deposited hazardous materials.

Based on their research, they produced a findings report titled *Benewah & Shoshone Counties, Idaho: Historic Sites with Potential Hazardous Materials* (J.P. Stravens 2006). For each identified site, the report included historical facility names and the facility names as of 2006, the facility address, the facility business type along with the potential hazardous material, and the facility's township, range, and section. There are no sites listed for the town of Burke (near Gem) within the half-mile buffer zone.

3.2.2 *UST-LUST Database Search*

IDEQ maintains a record of active and closed UST sites across the state. The list is available through an online database and includes information regarding site USTs, LUSTs, and general remediation activities. There no sites in the IDEQ UST-LUST database that is within the half-mile buffer zone of the remedy protection construction area.

3.2.3 *Waste Remediation Facility Mapper*

IDEQ's Facility Mapper serves those interested in finding the location and additional details regarding remediation sites and facilities managed by regulatory programs within the Waste Management and Remediation Division. In addition, the Facility Mapper provides information on which remediation sites across the state have had activity and use limitations (AUL) implemented on their property in the form of environmental covenants. There is one listed site on the Facility Mapper that is within the half-mile buffer zone of the remedy protection construction area.

- **Hecla Gem Assay Lab** at 3576 Burke Road (Site C on Figure 2 and in Table 1). This facility is comprised of equipment and supply storage, sample preparation area, a wet lab, fire assay room, and waste storage area. Ore samples are prepped for size

reduction and the addition of fluxing reagents prior to assaying. The majority of hazardous waste generated within the facility is derived from assaying mineral ore samples. The prepared samples are placed in crucibles and placed into the furnace for heating. The resultant lead button is further treated when placed into a cupel and reheated. As the lead oxidizes in the furnace, it is driven into the cupel, leaving a bead of metal behind. Though waste crucibles may not be regulated as hazardous waste, the cupels exhibit the toxicity characteristic for lead. Typically, when discarded, the waste crucibles are stored in the same container as the waste cupels. This facility has a RCRA hazardous waste ID Number of IDR000206300 and is generally designated as a small quantity generator, which produces between 220 pounds and 2,200 pounds of D008, lead, hazardous waste in a calendar year. Because of the strike at the Lucky Friday mine during the 2018 reporting period, its status was classified as a very small quantity generator, which produces less than 220 pounds of hazardous waste in a calendar year. Based on this information, metals are the potential hazardous materials for this site.

3.3 Site Windshield Survey

Alta's staff performed a windshield survey of sites identified as having potential environmental conditions based on the database research. These surveys included taking pictures of the identified site and obtaining current addresses, business names, and activities of the site. Current site information and photographs from the windshield surveys are included in Attachment B.

Section 4 Findings

The historical database searches identified four sites that are within a half-mile buffer zone of the site. Table 1 presents these sites along with current information.

Two categories were applied to these sites based on reasonably accessible site information:

- No RECs – sites labeled as no RECs were determined to not have an impact on the remedy protection construction based on the reasonably accessible information.
- Likely RECs – sites labeled as likely RECs historically had or currently have hazardous materials or petroleum products. These sites, based on reasonably accessible site information, may pose an environmental condition to the remedy protection construction.

Considering the spatial information and the general topography, none of the sites listed in this report are likely RECs and will likely not pose any environmental impacts to the remedy protection construction project.

Section 5 References and Resources Used

ASTM E1527-13. 2013. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. December.

EDR. 2018. The EDR Radius Map™ Report with GeoCheck®: Gem Townsite Remedy Protection Area, 3475 Burke Road, Wallace, ID 83873, Inquiry Number: 5489675.2s. 6 Armstrong Road, 4th floor, Shelton, CT 06484, November 19, 2018.

IDEQ. Underground Storage Tank Database Facility Search, <http://www2.deq.idaho.gov/waste/ustlust/Pages/Search.aspx>, accessed November 28 2018.

IDEQ. Waste Remediation Facility Mapper, <https://idaho.terradox.com/>, accessed November 28, 2018.

J.P. Stravens/Planning Associates, Inc. (J.P. Stravens). 2006. Benewah & Shoshone Counties, Idaho: Historic Sites with Potential Hazardous Materials. Prepared for the Idaho Department of Environmental Quality.

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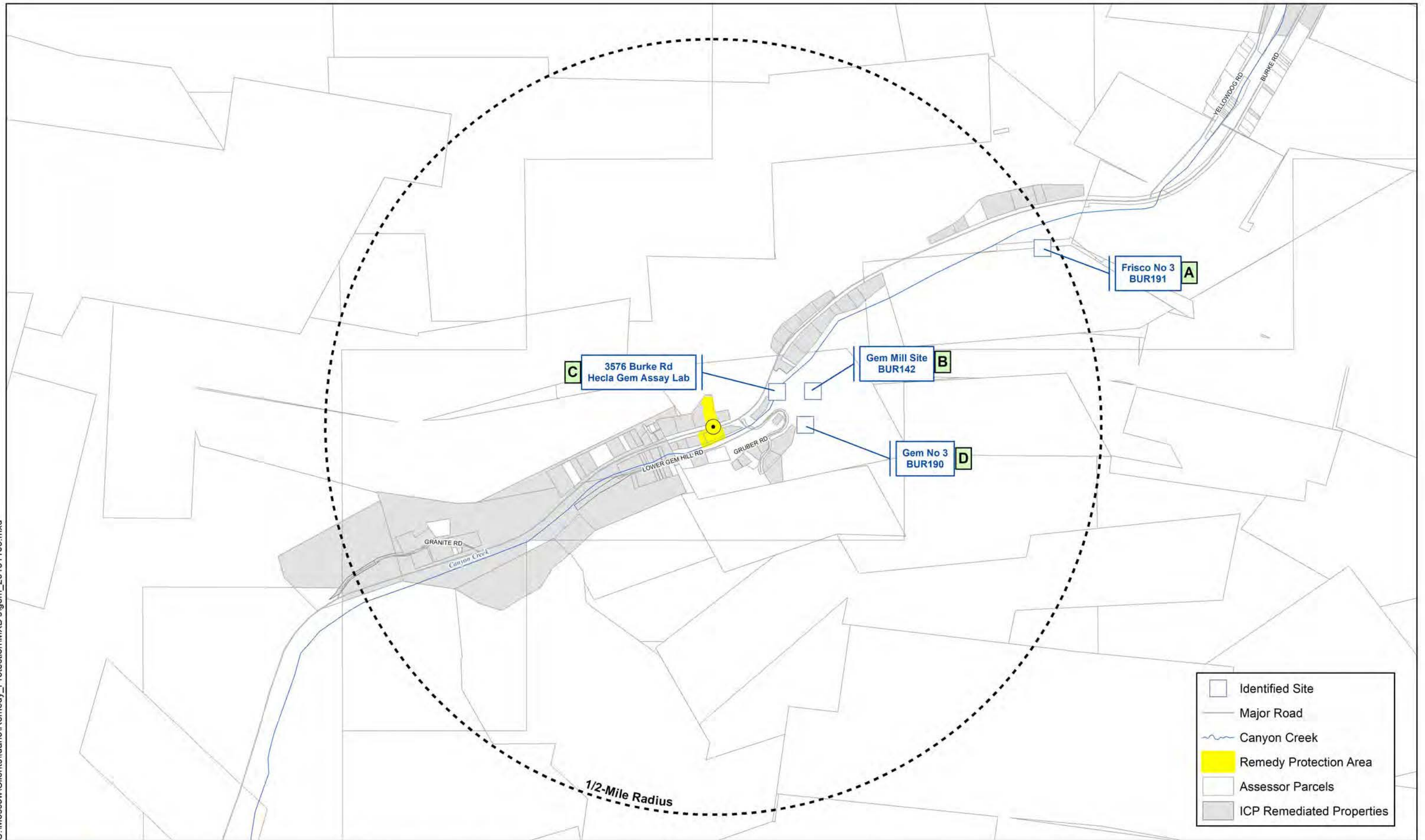


Table 1. Possible Identified Sites Near the Gem Drainage Remedy Protection Project

Site ID	Listed Facility Address	Listed City	Historical Facility Name	Parcel	Approximate Distance from Remedy Protection Corridor	Business Type	Potential Hazardous Materials	Potential Environmental Condition	Reference
A	47.5116027, -115.8590919	Wallace	Frisco No 3 BUR191	48N05E180200	2,400 feet northeast	Mine	Mining Metals	Potential remaining mining metals.	EDR / Waste Remediation Facility Mapper
B	47.50884103, -115.8659251	Wallace	Gem Mill Site BUR142	48N05E184950	660 feet east northeast	Mine	Mining Metals	Potential remaining mining metals.	EDR / Waste Remediation Facility Mapper
C	3576 Burke Rd.	Wallace	Hecla Gem Assay Lab	48N05E184950	420 feet northeast	RCRA Assay Lab	Mining Metals	Potential lead hazardous waste.	Waste Remediation Facility Mapper
D	47.50826549, -115.8660012	Wallace	Gem No 3 BUR190	48N05E184950	660 feet east	Mine	Mining Metals	Potential remaining mining metals.	EDR / Waste Remediation Facility Mapper

Attachment A
Additional IDEQ Documentation

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Frisco No 3 BUR191

*Site map is combined with BUR192 and BUR117 because boundaries between sites are indistinct

SITE VISIT FIELD CHECKLIST - Human Health Mine and Mill Sites
(Windshield Survey or Initial Survey to Determine Sampling Needs)

Site ID: BUR191 Site Name: FRISCO NO. 3
Date/Time: 11/12/14 12:00pm Field Team: Shelley Hicks, Abe Hanna
Watershed: SFCDA River Weather: clear, 15°F, windy

General Information

Method to Locate Site:
GPS ☐ Field Map ☒ Existing Info ☐ Other ☐

Access to Site:
Paved Road ☒ Improved Road ☐ 4WD Only ☐ Trail ☐ No Trail ☐ Other ☐

Site Features Consistent with Available Information: Yes ☒ No ☐ NA ☐
If No, Describe: _____

Site/Local Terrain:
Rolling/Flat ☐ Foothills ☐ Mountains ☒ Steep/Narrow Canyon ☒

Local Undisturbed Vegetation (check all that apply):
Weeds/Grass ☒ Brush ☒ Riparian/Marsh ☐ Deciduous Trees ☒ Pine/Spruce/Fir ☒

Comments: No gate access to site. Located up steep slope from BUR117 (no consent for access).

Receptors/Public Use/Presence

Nearest Resident (direction and distance, upgradient/downgradient, type: house, cabin, temporary structure):
Approximately 400' across Canyon Creek and Burke Canyon Rd. from site.

Residential Use:
☐ High (on-site, immediately adjacent, or within 200 feet of site)
☐ Moderate (within 1,000 feet of site, upgradient of residential area)
☒ Low (Little, if any, evidence for current residential use)

Recreational use:
☐ High (Visitors observed or evidence such as tire tracks, trash, graffiti, fire rings, etc.; good access to site)
☐ Moderate (Some evidence of visitors and site is accessible from a poor road or trail)
☒ Low (Little, if any, evidence of visitors and site is not easily accessible)

Nearest Observed Recreation (description and distance): roadside pullout with historic

Comments: Marker across Canyon Creek from site.

Surface Water

Nearest Surface Water:
Onsite ☐ 0-200 feet ☒ 200 feet-2miles ☐ >2miles ☐

Type of Surface Water:
Stream ☒ Pond ☐ Wetland/Bog ☐ Adit Discharge ☐ Seep ☐ Spring ☐

Erosion and Runoff Pathways: Downslope to BUR117 then to Canyon Creek.

Comments: _____

Decision Process to Determine If Sampling Needs to be Conducted

Sources: Describe on-site sources (waste piles, adits, other). waste rock appears to form leveled area and steep slopes of site

Pathways: Describe migration pathways for soil and surface water. Is there a likelihood for migration during current conditions, high precipitation, other? Where is the probably point of entry for surface water? Surface runoff will infiltrate and runoff to Frisco Millsite which sits below this site. May eventually report to Canyon Creek.

Receptors: Summarize potential receptors. Canyon Creek

Describe Potential Sampling Locations

Key Source Points (waste pile(s) or surface water from adit): waste rock

Suggestions for **number of samples** to characterization sources (e.g., size of waste piles): no sampling recommended

Probable Point of Entry into Surface Water: _____

Downstream (at least 100 feet): _____

If windshield survey and applicable information can be gathered, fill out supporting forms for Mine/Mill Waste, Structures, Photo Log and Site Map.

If initial survey determines proceeding with sample collection, then fill out all applicable supporting forms.

Mine Openings

Opening ID (i.e. 1, 2, 3)	NONE		
Opening Type			
Opening Height (ft)			
Opening Width (ft)			
Latitude			
Longitude			
Condition			
Water			
Discharge Point			
Indicators of Metal Release			
Sample ID			
Sample Date/Time			
Sample Latitude			
Sample Longitude			
Flow (gpm)			
Method of Measurement			

Comments No mine openings observed from afar.

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Types of Openings: ADIT, SHAFT, PIT=Open pit/trench, HOLE=Prospect Hole, WELL=Well

Condition: INTACT = intact, PART = partially collapsed or filled, COLP = filled or collapsed, SEAL = Adit plug, GATE = Gate barrier

Water: NO = No water or indicators of water, FLOW = Water flowing, INTER = Indicators of intermittent flow, STAND = Standing water only

Discharge Point: INF=Infiltrates and doesn't emerge, STREAM=Stream, SW=Surface water other than stream

Indicators of Metals (Include all that apply): NO=None, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present

Method Measurement: EST=Estimate, BUCK=Bucket and time, METER=Flow meter

Mine/Mill Waste

Waste ID (i.e., 1, 2, 3)	1		
Waste Type	WASTE		
Area			
Approx. Volume			
Size of Material	COBBLE		
Wind Erosion	UNK		
Vegetation	SPARSE		
Surface Drainage	NO		
Indicators of Metals	STAIN		
Stability	MOD		
Location with Respect to Floodplain	OUT		
Distance to Stream	150'		
Sample ID			
Sample Date/Time			

Comments No direct observations of material were made due to limited access.

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Waste Type WASTE=Waste rock dump, MILL=Mill tailings, SPOIL=Overburden or spoil pile, HIGH=Highwall,

PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon, ORE=Ore Stockpile, HEAP=Heap leach

Size of Material (if composed of different size fractions, enter the sizes that are present in significant amounts):

FINE=finer than sand, SAND=sand, GRAVEL=>sand and <2", COBBLE=2"-6", BOULD=>6"

Wind Erosion, potential for: HIGH=Fine, dry material that could easily become airborne, airborne dust, or windblown deposits, MOD=Moderate, some fine material, or fine material that is usually wet or partially cemented, LOW=Little if any fines, or fines that are wet year-round or well cemented

Vegetation (density on waste): DENSE=Ground cover >75%, MOD=Ground cover 25%-75%, SPARSE=Ground cover <25%, BARREN=Barren

Surface Drainage (Include all that apply): RILL=Surface flow channels mostly <1' deep, GULLY=Flow channels >1' deep, SEEP=Intermittent or continuous discharge from waste deposit, POND=Seasonal or permanent ponds on feature, BREACH=Breached, NO=No indicators of surface flow observed

Indicators of Metals (Include all that apply): NO=None, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present

Stability EMER=Imminent mass failure, LIKE=Potential for mass failure, LOW=Mass failure unlikely

Location with Respect to Floodplain: IN=In contact with normal stream, NEAR=In riparian zone or floodplain, OUT=out of floodplain

Structures

Type	building	crib walls	
Number	1	numerous	
Condition	BAD	POOR-BAD	

Comments: partial building / fencing observed on flat surface near top of site which is mostly collapsed. Crib walls throughout site in various stages of collapse.

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Type: CABIN=Cabin or community service (store, church, etc.). MILL=Mill building, MINE=building related to mine operation, STOR=Storage shed, FLUME=Ore chute/flume or tracks for ore transport

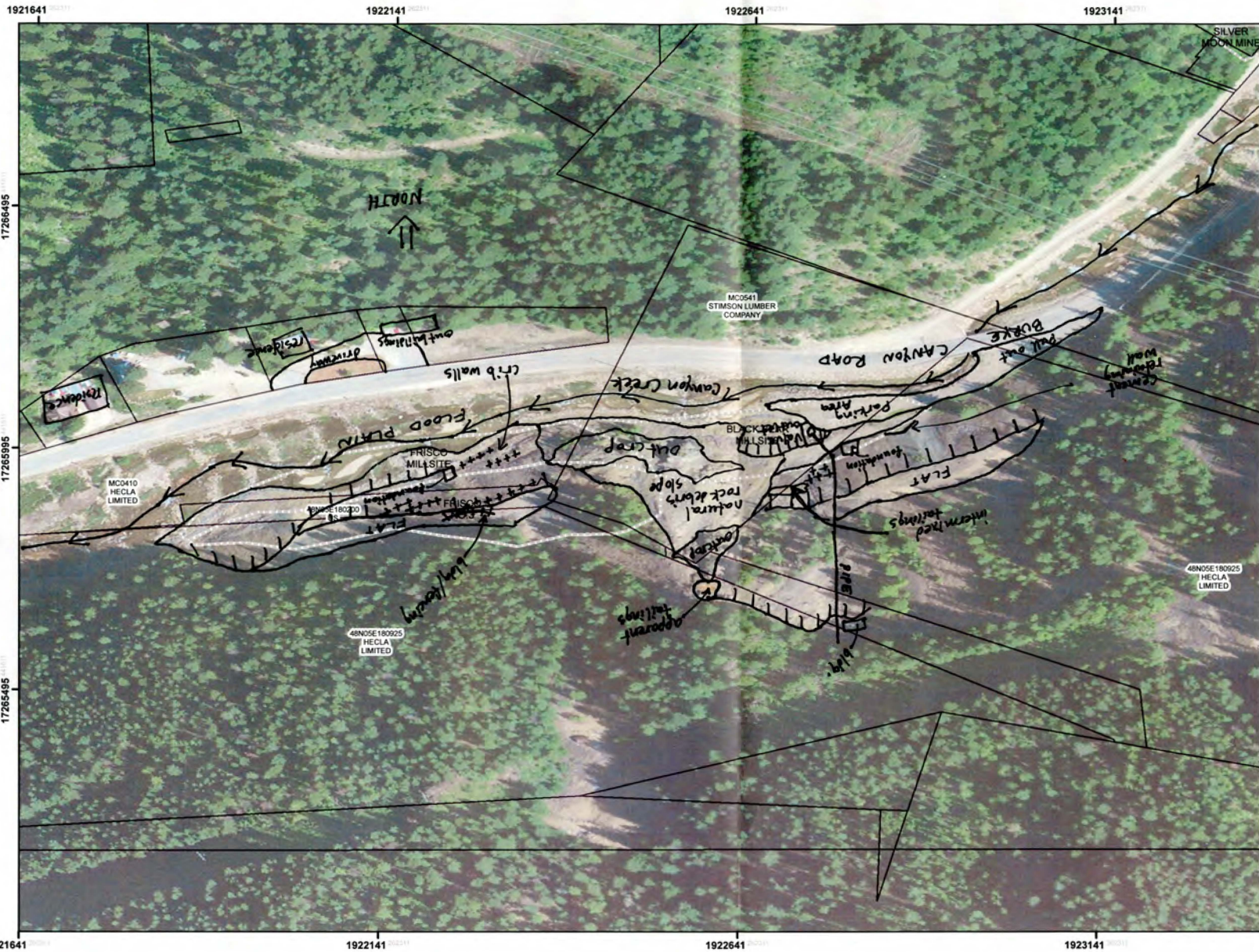
Number: Number of particular type of structure all in similar condition or length in feet

Condition: GOOD=all components of structure intact and appears stable, FAIR=most components present but signs of deterioration, POOR=major component (roof, wall, etc.) of structure has collapsed or is on the verge of collapsing, BAD=More than half of the structure has collapsed

Additional comments/observations not otherwise covered:

Description of Observed Exposure Pathways:

Description of Potential Receptors:



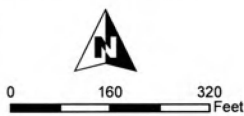
Mine and Mill Site Assessment 2014

Frisco Millsite
BUR117
Black Bear Millsite
BUR192
Frisco No. 3
BUR191

Parcel Boundary

Mine and Mill
Site Boundary

Map Date: 11/12/2014
Cartographer: Abe Hanna



TerraGraphics
Environmental Engineering, Inc.

This map was produced using information obtained from several different sources that have not been independently verified. These sources have also not provided information on the precision and accuracy of the data. Information on this map is not a substitute for survey data.



Photo 931: West end of site looking SSW.



Photo 932: Central portion of site looking S.



Photo 933: East end of site looking SSE.



Photo 934: Outcrops at east end of site looking S.



Photo 935: Black Bear from Frisco looking SE.



Photo 936: East end of Frisco from Black Bear Millsite.

Gem Mill Site BUR142

SITE VISIT FIELD CHECKLIST - Human Health Mine and Mill Sites
(Windshield Survey or Initial Survey to Determine Sampling Needs)

Site ID: BUR142 Site Name: Gem Mill Site
Date/Time: 9/24/14 10:45am Field Team: Shelley Hicks, Abe Hanna, Jan Olsen
Watershed: South Fork CoA River Weather: Sunny, 75°

General Information

Method to Locate Site:
GPS ☐ Field Map ☒ Existing Info ☐ Other ☐

Access to Site:
Paved Road ☐ Improved Road ☒ 4WD Only ☐ Trail ☐ No Trail ☐ Other ☐

Site Features Consistent with Available Information: Yes ☒ No ☐ NA ☐
If No, Describe: _____

Site/Local Terrain:
Rolling/Flat ☐ Foothills ☐ Mountains ☒ Steep/Narrow Canyon ☒

Local Undisturbed Vegetation (check all that apply):
Weeds/Grass ☒ Brush ☒ Riparian/Marsh ☐ Deciduous Trees ☒ Pine/Spruce/Fir ☒

Comments: Site access on good gravel road across one-lane bridge from Burke Rd. Gravel road is well maintained and is used to access residential area adjacent to south end of property.

Receptors/Public Use/Presence

Nearest Resident (direction and distance, upgradient/downgradient, type: house, cabin, temporary structure):
Downgradient (south) of mill site is residential area - multiple houses. Private owned shop is located within site boundary.

Residential Use:
☒ High (on-site, immediately adjacent, or within 200 feet of site)
☐ Moderate (within 1,000 feet of site, upgradient of residential area)
☐ Low (Little, if any, evidence for current residential use)

Recreational use:
☒ High (Visitors observed or evidence such as tire tracks, trash, graffiti, fire rings, etc.; good access to site)
☐ Moderate (Some evidence of visitors and site is accessible from a poor road or trail)
☐ Low (Little, if any, evidence of visitors and site is not easily accessible)

Nearest Recreational Area (name and distance): ATV/motor-bike use on-site.

Comments: Access to residence across site. Refuse dump is located on site (old mattress, furniture, scrap wood, branches). Active assay lab on-site.

Surface Water

Nearest Surface Water:
Onsite ☐ 0-200 feet ☒ 200 feet-2miles ☐ >2miles ☐

Type of Surface Water:
Stream ☒ Pond ☐ Wetland/Bog ☐ Adit Discharge ☐ Seep ☐ Spring ☐

Erosion and Runoff Pathways: Erosion is evident down ATV/dirt bike tracks. Sediment is located at base of stockpile near ends of some ATV tracks. No direct erosional/
Comments: runoff pathways are observed going into the creek. Remediated road is barrier between stockpile and stream. Stockpile has been recontoured and revegetated with some bare spots of exposed material.

Decision Process to Determine If Sampling Needs to be Conducted

Sources: Describe on-site sources (waste piles, adits, other). Mine waste pile is located along east edge of site.

Pathways: Describe migration pathways for soil and surface water. Is there a likelihood for migration during current conditions, high precipitation, other? Where is the probably point of entry for surface water? Surface water runoff and is likely to pond along toe of dump and not reach creek. Revegetated slope keeps soil stable from wind and water erosion. The access road across the site is remediated.

Receptors: Summarize potential receptors. Creek and human contact with exposed soils in ATV tracks. Localized dust possible during ATV activities.

Describe Potential Sampling Locations

Background: This site was characterized by the C&A Trust in 2011. Site access road and property around privately owned shop was remediated by the BPRP program. No additional sampling is required.

Key Source Points (waste pile(s) or surface water from adit):

Exposed soil in ATV tracks on stockpile.

Suggestions for number of samples to characterization sources (e.g., size of waste piles):

None.

Probable Point of Entry into Surface Water:

None.

Downstream (at least 100 feet):

If windshield survey and applicable information can be gathered, fill out supporting forms for Mine/Mill Waste, Structures, Photo Log and Site Map.

If initial survey determines proceeding with sample collection, then fill out all applicable supporting forms.

Mine Openings

Opening ID (i.e., 1, 2, 3)	NONE		
Opening Type			
Opening Height (ft)			
Opening Width (ft)			
Latitude			
Longitude			
Condition			
Water			
Discharge Point			
Indicators of Metal Release			
Sample ID			
Sample Date/Time			
Sample Latitude			
Sample Longitude			
Flow (gpm)			
Method of Measurement			

Comments:

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Types of Openings: ADIT, SHAFT, PIT=Open pit/trench, HOLE=Prospect Hole, WELL=Well

Condition: INTACT = intact, PART = partially collapsed or filled, COLP = filled or collapsed, SEAL = Adit plug, GATE = Gate barrier

Water: NO = No water or indicators of water, FLOW = Water flowing, INTER = Indicators of intermittent flow, STAND = Standing water only

Discharge Point: INF=Infiltrates and doesn't emerge, STREAM=Stream, SW=Surface water other than stream

Indicators of Metals (include all that apply): NO=None, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present

Method Measurement: EST=Estimate, BUCK=Bucket and time, METER=Flow meter

Mine/Mill Waste

Waste ID (i.e., 1, 2, 3)	1		
Waste Type	WASTE		
Area			
Approx. Volume			
Size of Material	COBBLE, FINE		
Wind Erosion	LOW		
Vegetation	DENSE		
Surface Drainage	RILL, GULLY		
Indicators of Metals	STAIN		
Stability	LOW		
Location with Respect to Floodplain	OUT		
Distance to Stream	60'		
Sample ID			
Sample Date/Time			

Comments: Low potential for wind erosion due to re-vegetation. Local dust may be caused during ATV activity on stockpile.

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Waste Type: WASTE=Waste rock dump, MILL=Mill tailings, SPOIL=Overburden or spoil pile, HIGH=Highwall, PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon, ORE=Ore Stockpile, HEAP=Heap leach
Size of Material (if composed of different size fractions, enter the sizes that are present in significant amounts):

FINE=finer than sand, SAND=sand, GRAVEL=>sand and <2", COBBLE=2"-6", BOULD=>6"

Wind Erosion, potential for: HIGH=Fine, dry material that could easily become airborne, airborne dust, or windblown deposits, MOD=Moderate, some fine material, or fine material that is usually wet or partially cemented, LOW=Little if any fines, or fines that are wet year-round or well cemented.

Vegetation (density on waste): DENSE=Ground cover >75%, MOD=Ground cover 25%-75%, SPARSE=Ground cover <25%, BARREN=Barren

Surface Drainage (Include all that apply): RILL=Surface flow channels mostly <1' deep, GULLY=Flow channels >1' deep, SEEP=Intermittent or continuous discharge from waste deposit, POND=Seasonal or permanent ponds on feature, BREACH=Breached, NO=No indicators of surface flow observed

Indicators of Metals (Include all that apply): NO=None, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present

Stability: EMER=Imminent mass failure, LIKE=Potential for mass failure, LOW=Mass failure unlikely

Location with Respect to Floodplain: IN=In contact with normal stream, NEAR=In riparian zone or floodplain, OUT=out of floodplain

Structures

Type	MINE		
Number	5		
Condition	GOOD		

Comments: Active assay lab located on site.

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Type: CABIN=Cabin or community service (store, church, etc.), MILL=Mill building, MINE=building related to mine operation, STOR=Storage shed, FLUME=Ore chute/flume or tracks for ore transport

Number: Number of particular type of structure all in similar condition or length in feet

Condition: GOOD=all components of structure intact and appears stable, FAIR=most components present but signs of deterioration, POOR=major component (roof, wall, etc.) of structure has collapsed or is on the verge of collapsing, BAD=More than half of the structure has collapsed

Additional comments/observations not otherwise covered: Adjacent to north end of site are old mine debris on steep hillside. (Cement footings and wood debris). Rock/soil material appears to be native hillslope material.

Description of Observed Exposure Pathways:

Description of Potential Receptors:



Photo 1: Mill site looking north.



Photo 2: Mill site looking northeast.



Photo 3: Mill site old foundation.



Photo 4: Mill site looking southwest.



Photo 5: Mill site looking west (private garage).



Photo 6: Mill site being used for trash burning.



Photo 7: Old electrical building on site.



Photo 8: Old trammel on site.



Photo 9: ATV tracks up the mine dump.



Photo 9A: ATV tracks up the mine dump.



Photo 10: ATV tracks up the mine dump.



Photo 11: ATV tracks and remediated rail ROW.



Photo 12: ATV tracks and remediated rail ROW.



Photo 13: Looking S across site from mid-road.



Photo 14: ATV trail, remediated road, and Canyon Ck.



Photo 15: Contaminated/stained area by electrical bldg.



Photo 16: Waste pile from mid-road looking east.



Photo 17: Mine dump above mill site with jig tailings.



Photo 18: Waste pile on hillside above mill site.



Photo 18A: Waste pile on hillside above mill site.



Photo 19: Old fire hydrant above mill site.



Photo 20: Above mine dumb, Gem Hill Road looking N.



Photo 21: Inside mill foundation wall looking NE.



Photo 22: Child's blanket inside mill foundation wall.

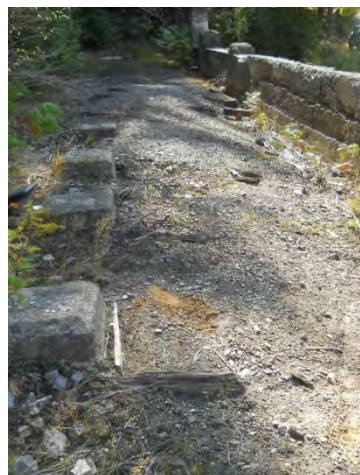


Photo 23: Inside mill foundation wall looking SW.



Photo 24: Old mill site foundations.



Photo 25: Old mill site foundations looking SW.



Photo 26: Old mill site.



Photo 27: Remediated road south end of site.



Photo 28: ATV tracks on face of mine dump.



Photo 29: North end of waste dump from mid-level.



Photo 30: Revegetation of mine dump slope.



Photo 31: Revegetation of mine dump slope.

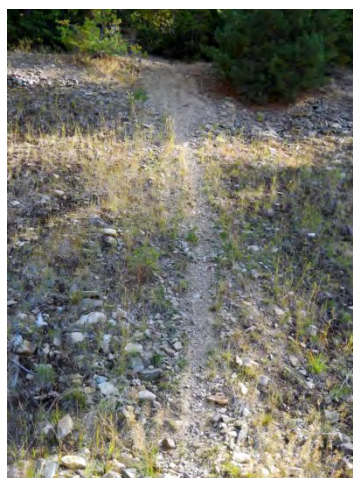


Photo 32: Dirt bike track up face of upper waste dump.



Photo 33: Overview of lower portion of site.



Photo 34: Exposed waste above electrical building.



Photo 35: Steel pipe below upper tailings pile.



Photo 36: Coarse rock below upper tailings pile.



Photo 37: View of trash pile from upslope.



Photo 38: Looking down face of tailings pile.



Photo 39: Looking down face of tailings pile.



Photo 40: Vegetation at south end of site.



Photo 41: Overgrown road above site.



Photo 42: Overgrown road above site.

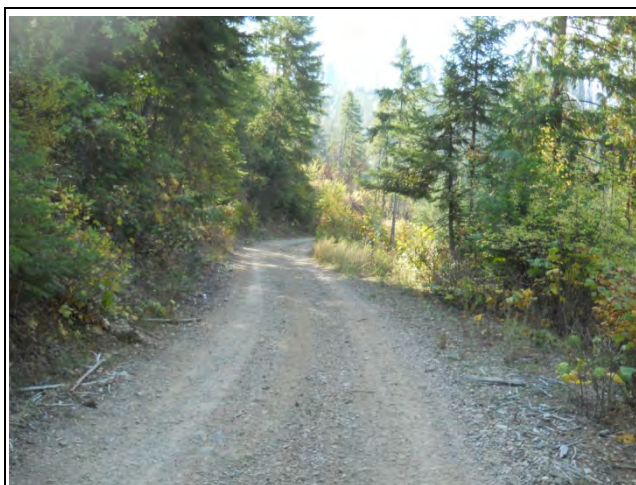


Photo 43: Gem Hill Road



Photo 44: Pipe in embankment above site.



Photo 45: Looking down face of waste dump.



Photo 46: Upper waste pile.



Photo 47: Hillside at north end of site.



Photo 48: XRF shot location on mill foundation tailings.



Photo 49: Erosion of tailings down hillside.



Photo 50: Steel pipe adjacent to upper tailings.



Photo 51: XRF shot location in foundation tailings.



Photo 52: Entry path to inside portion of mill foundation

BUR142: Gem Mill Site
BUR190: Gem No. 3

Site Pictures



Photo 53: Field crew taking XRF shot.

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Hecla Gem Assay Lab

RECEIVED

APR 11 2016



SEND COMPLETED FORM TO: The Appropriate State or Regional Office.	United States Environmental Protection Agency RCRA SUBTITLE C SITE IDENTIFICATION FORM		
1. Reason for Submittal MARK ALL BOX(ES) THAT APPLY	Reason for Submittal: <input checked="" type="checkbox"/> To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location) <input type="checkbox"/> To provide a Subsequent Notification (to update site identification information for this location) <input type="checkbox"/> As a component of a First RCRA Hazardous Waste Part A Permit Application <input type="checkbox"/> As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment # _____) <input type="checkbox"/> As a component of the Hazardous Waste Report (If marked, see sub-bullet below) <input type="checkbox"/> Site was a TSD facility and/or generator of >1,000 kg of hazardous waste, >1 kg of acute hazardous waste, or >100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQG regulations)		
2. Site EPA ID Number	EPA ID Number <u>IDA1000206300</u>		
3. Site Name	Name: <u>Gem Assay Lab</u>		
4. Site Location Information	Street Address: <u>3576 Burke Rd</u> City, Town, or Village: <u>Wallace</u> County: <u>Shoshone</u> State: ID Country: <u>US</u> Zip Code: <u>83873</u>		
5. Site Land Type	<input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other		
6. NAICS Code(s) for the Site (at least 5-digit codes)	A. <u>21222</u> C. <u> </u> B. <u> </u> D. <u> </u>		
7. Site Mailing Address	Street or P.O. Box: <u>P.O. Box 31</u> City, Town, or Village: <u>Mullan</u> State: ID Country: <u>US</u> Zip Code: <u>83846</u>		
8. Site Contact Person	First Name: <u>Lance</u> MI: <u> </u> Last: <u>Boylan</u> Title: <u>Environmental Supervisor</u> Street or P.O. Box: <u>P.O. Box 31</u> City, Town or Village: <u>Mullan</u> State: ID Country: <u>US</u> Zip Code: <u>83846</u> Email: <u>lboylan@hecla-mining.com</u> Phone: <u>208-744-1751</u> Ext.: <u>2242</u> Fax: <u>208-744-1317</u>		
9. Legal Owner and Operator of the Site	A. Name of Site's Legal Owner: <u>Hecla Limited</u> Date Became Owner: <u>12/30/1903</u> Owner Type: <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other Street or P.O. Box: <u>6500 N. Mineral Drive, Suite 200</u> City, Town, or Village: <u>Coeur d'Alene</u> Phone: <u>208-769-4100</u> State: ID Country: <u>US</u> Zip Code: <u>83815</u> B. Name of Site's Operator: <u>Hecla Limited</u> Date Became Operator: <u>12/30/1903</u> Operator Type: <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other		

10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-10.Y ☒ N ☐**1. Generator of Hazardous Waste**

If "Yes," mark only one of the following – a, b, or c.

- ☐ a. LQG: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs/mo.) or more of hazardous waste; or Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs/mo) of acute hazardous waste; or Generates, in any calendar month, or accumulates at any time, more than 100 kg/mo (220 lbs/mo) of acute hazardous spill cleanup material.

- ☒ b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs/mo) of non-acute hazardous waste.

- ☐ c. CESQG: Less than 100 kg/mo (220 lbs/mo) of non-acute hazardous waste.

If "Yes" above, indicate other generator activities in 2-10.

Y ☐ N ☒

- 2. Short-Term Generator** (generate from a short-term or one-time event and not from on-going processes). If "Yes," provide an explanation in the Comments section.

Y ☐ N ☒

- 3. United States Importer of Hazardous Waste**

Y ☐ N ☒

- 4. Mixed Waste (hazardous and radioactive) Generator**

Y ☐ N ☒**5. Transporter of Hazardous Waste**

If "Yes," mark all that apply.

- ☐ a. Transporter
- ☐ b. Transfer Facility (at your site)

Y ☐ N ☒**6. Treater, Storer, or Disposer of Hazardous Waste**

Note: A hazardous waste Part B permit is required for these activities.

Y ☐ N ☒**7. Recycler of Hazardous Waste**Y ☐ N ☒**8. Exempt Boiler and/or Industrial Furnace**

If "Yes," mark all that apply.

- ☐ a. Small Quantity On-site Burner Exemption
- ☐ b. Smelting, Melting, and Refining Furnace Exemption

Y ☐ N ☒**9. Underground Injection Control**Y ☐ N ☒**10. Receives Hazardous Waste from Off-site****B. Universal Waste Activities; Complete all parts 1-2.**Y ☐ N ☒

- 1. Large Quantity Handler of Universal Waste** (you accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste managed at your site. If "Yes," mark all that apply.

- a. Batteries ☐
- b. Pesticides ☐
- c. Mercury containing equipment ☐
- d. Lamps ☐
- e. Other (specify) _____ ☐
- f. Other (specify) _____ ☐
- g. Other (specify) _____ ☐

Y ☐ N ☒**2. Destination Facility for Universal Waste**

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities; Complete all parts 1-4.Y ☐ N ☒**1. Used Oil Transporter**

If "Yes," mark all that apply.

- ☐ a. Transporter
- ☐ b. Transfer Facility (at your site)

Y ☐ N ☒**2. Used Oil Processor and/or Re-refiner**

If "Yes," mark all that apply.

- ☐ a. Processor
- ☐ b. Re-refiner

Y ☐ N ☒**3. Off-Specification Used Oil Burner**Y ☐ N ☒**4. Used Oil Fuel Marketer**

If "Yes," mark all that apply.

- ☐ a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
- ☐ b. Marketer Who First Claims the Used Oil Meets the Specifications

D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

- ❖ You can ONLY Opt into Subpart K if:

- you are at least one of the following: a college or university; a teaching hospital that is owned by or has a formal affiliation agreement with a college or university; or a non-profit research institute that is owned by or has a formal affiliation agreement with a college or university; AND
- you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state

- you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state

Y ☐ N ☒ 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories
See the item-by-item instructions for definitions of types of eligible academic entities. Mark all that apply:

☐ a. College or University☐ b. Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university

☐ c. Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university

Y ☐ N ☒ 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

11. Description of Hazardous Waste

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

[illegible]

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-Regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

[illegible]



April 6th, 2016

Rene Anderson
Department of Environmental Quality
1410 North Hilton
Boise, ID 83706

RECEIVED
APR 11 2016
DEPT. OF ENVIRONMENTAL QUALITY
WASTE PROGRAM

Re: Gem Assay Lab RCRA Subtitle C Identification Form

Dear Mrs. Anderson,

Attached to this email is a RCRA Subtitle C Site Identification Form – Initial Notification which is being submitted to obtain an EPA ID number for the Gem Assay Lab located in Burke Canyon, Wallace Id.

As requested, the Lat/Long for this facility is has been included under Section 13 of the attached form.

Please do not hesitate to call me at (208) 744-1751 ext. 2242 if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Lance Boylan".

Lance Boylan
Environmental Supervisor
Lucky Friday Mine

LB/lb
Enclosures

Cc: LF Environmental Files



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
John H. Tippetts, Director

April 15, 2016

Lance Boylan
Hecla Limited
PO Box 31
Mullan, ID 83846

Dear Mr. Boylan:

Re: Acknowledgment of Notification of Regulated Waste Activity

This is to acknowledge you have filed a "Notification of Regulated Waste Activity" form, for the installation located at the address shown below, to comply with Section 3010 of the Resource Conservation and Recovery Act (RCRA).

FACILITY NAME: **Hecla Gem Assay Lab**
EPA I.D. NUMBER: **IDR000206300**
LOCATION ADDRESS: **3576 Burke Rd**
Wallace Idaho 83873

Your EPA Identification Number must be included on:

- 1) All shipping manifests for transporting hazardous wastes
- 2) All state annual generator reports that large and small quantity generators of hazardous wastes must file
- 3) All federal biennial reports that large quantity generators of hazardous wastes and owners and operators of hazardous waste treatment, storage, and disposal facilities must file
- 4) All applications for federal hazardous waste permits
- 5) All other hazardous waste management reports and documents required under Subtitle C of RCRA

According to Idaho Statute 39-4411(4), large and small quantity generators are required to submit a *Hazardous Waste Generator Annual Report*. A copy of the Annual Report Form, with instructions, is enclosed. Conditionally Exempt SQGs are not required to submit the report. Generator status may be determined by the chart below.

Generator Status	Large Quantity Generator	Small Quantity Generator	Conditionally Exempt SQG
Amount of waste generated during a calendar month	>2,200 pounds (1,000 kg) or 2.2 (1 kg) pounds acute	>220 pounds (100 kg) but <2,200 pounds (1,000 kg)	<220 pounds

If you have any questions or any corrections to make on the above information, please call me at 208/373-0210.

Sincerely,

René Anderson
Hazardous Waste Data Coordinator
Waste Management & Remediation Division

/ra RCRAINFOHANDLER\CORRESPONDENCE\ACKNOWLEDGMENT\16\Hecla Gem Lab

cc: FH



IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

VERIFICATION OF RCRA
REGULATED ACTIVITY

Please review the following information and provide any corrections or updates in the spaces provided.

DATA FIELD	INFORMATION CURRENTLY LISTED	CORRECTIONS/CHANGES/UPDATES
Facility Name	HECLA GEM ASSAY LAB	N/A
EPA ID Number	IDR000206300	N/A (ID Number is for this location only)
Location Address	3576 Burke Rd	N/A
Location City	Wallace	N/A
Location State	ID	N/A
Location Zip	83873	N/A
Contact Person	Lance Boylan	N/A
Contact Address	PO Box 31	N/A
Contact City	Mullan	N/A
Contact State	ID	N/A
Contact Zip	83846	N/A
Contact Phone Number	208-744-1751 2242	208-744-1833
Contact e-Mail Address	lboylan@hecla-mining.com	N/A

Please verify this site's current RCRA regulated activity by checking all appropriate boxes below and **returning the signed form to Rene' Anderson at Idaho DEQ by November 30, 2017**. Questions? Call Ms. Anderson at 208-373-0210.

Idaho Department of Environmental Quality
1410 N Hilton
Boise, ID 83706

- ☒ If this site generates hazardous waste (HW) in any calendar month, please check the appropriate box below.
- ☐ LQG [2,200 lbs. or more of HW or more than 2.2 lbs. of Acute HW in any calendar month]
 - ☐ SQG [More than 220 lbs., but less than 2,200 lbs. of HW in any calendar month]
 - ☒ CESQG [Less than 220 lbs. of HW or less than 2.2 lbs. of Acute HW in all calendar months]
- ☐ Other HW activities
- ☐ US Importer of HW
 - ☐ Mixed Waste (hazardous and radioactive) Generator
 - ☐ HW Transporter or Transfer Facility
 - ☐ Recycler of HW
 - ☐ Receiver of HW from off-site
- ☐ Universal waste activity [Check this only if accumulate or manage amounts of 11,000 lbs. or greater]
- ☐ Used Oil activity
- ☐ UO Transporter or Transfer Facility
 - ☐ UO Processor or Re-refiner
 - ☐ Off-specification UO Burner
 - ☐ UO Fuel Marketer
 - ☐ Directs Off-specification UO to Off-specification UO Burner
 - ☐ First claims UO meets specifications
- ☐ Hazardous Secondary Material (HSM) activity
- ☐ Inactive [This site no longer conducts any regulated RCRA activity listed above]

I certify that, to the best of my knowledge and belief, this information is true, accurate, and complete.

Authorized Representative

11/28/2017
Date



HECLA LUCKY FRIDAY

RECEIVED

DEC 01 2017

DEPT. OF ENVIRONMENTAL QUALITY
WASTE PROGRAM

November 28, 2017

Rene' Anderson
Idaho Department of Environmental Quality
1410 N Hilton
Boise, ID 83706

Re: Hecla Gem Assay Lab Verification of RCRA Regulated Activity

Dear Mrs. Anderson,

Enclosed you will find the Verification of RCRA Regulated Activity form for the Hecla Gem Assay Lab facility. In short, the only change on the form is my updated office number which is now 208.744.1833. If you have any questions regarding this form please do not hesitate to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Lance Boylan".

Lance Boylan
Environmental Supervisor
Hecla Limited, Lucky Friday Mine

LB/lb
cc: T. Kilbreath



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
John H. Tippetts, Director

July 23, 2018

Lance Boylan
Hecla Mining Company
P.O. Box 31
Mullan, Idaho 83846

RE: Compliance Evaluation Inspection, Hecla Gem Assay Lab
EPA ID Number: IDR000206300

Dear Mr. Boylan:

On June 7, 2018, the Idaho Department of Environmental Quality (DEQ) conducted a routine scheduled compliance enforcement inspection (CEI) at the Hecla Gem Assay Lab (facility) located in Wallace, Idaho.

The report for the CEI has been completed, and a copy is enclosed. At the time of the inspection, no alleged violations of the Rules and Standards for Hazardous Waste were observed at the facility.

This letter, however, does not relieve your facility from future compliance with the Idaho HWMA/RCRA and the Rules and Standards for Hazardous Waste.

Thank you for the courtesies and cooperation extended by Messrs. Thomas and Hasz to DEQ during the inspection. If you have any questions, please contact me at (208) 373-0566 or Monja Metcalf at (208) 769-1422.

Sincerely,

A handwritten signature in cursive script that reads "Brian Gaber".

Brian Gaber
Senior Hazardous Waste Inspector
Technical Services Division
DEQ – State Office
brian.gaber@deq.idaho.gov

BG:sjt
Enclosure

EC: Gary Stevens, DEQ-Coeur d'Alene Regional Office
Monja Metcalf, DEQ-Coeur d'Alene Regional Office
EDMS 2018BCU30

HWMA/RCRA COMPLIANCE INSPECTION REPORT

Date of Inspection: June 7, 2018

Facility: Hecla Gem Assay Lab (Hecla)

EPA Identification Number: IDR000206300

Physical Address: 3576 Burke Road
Wallace, Idaho 83873

Mailing Address: PO Box 31
Mullan, Idaho 83846

Facility Contact: Lance Boylan

Contact Telephone Number: 208-744-1751 Ext. 2242 (office)
(b) (6) (cell)

Contact Email: lboylan@hecla-mining.com

Report Prepared By: Brian Gaber
Senior Hazardous Waste Inspector
Technical Services Division
Idaho Department of Environmental Quality

Inspection Participants: Brian Gaber, DEQ – State Office
Monja Metcalf, DEQ – Coeur d'Alene Office
Clay Thomas, Hecla – Environmental Engineer
Torin Hasz, Hecla – Concentrator Supervisor

Background Information:

The Hecla Mining Company which operates its metallurgic research laboratory, the Gem Assay Lab, is located adjacent to Canyon Creek near the former community of Gem.

An initial RCRA Subtitle C Site ID notification request as a Small Quantity Generator (SQG) was submitted on April 6, 2016. A Notification Update was received on December 1, 2017 in which Hecla reported a change in hazardous waste generator status from SQG to Conditionally Exempt Small Quantity Generator (CESQG). An annual Hazardous Waste Generator Report for 2017 was received on January 19, 2018.

The Idaho Department of Environmental Quality (DEQ) had not previously conducted an inspection at this facility.

Purpose:

The purpose of the June 7, 2018 routine compliance inspection was to assess the facility's compliance with the Federal Resource Conservation and Recovery Act (RCRA)/Idaho Hazardous Waste Management Act (HWMA), and the Idaho Rules and Standards for Hazardous Waste.

Inspection:

On June 5th, Monja Metcalf and I arrived at the Hecla Gem Assay Lab (facility) location where we found the facility unoccupied. Consequently, I contacted Lance Boylan who arranged for us to meet with his staff to conduct the inspection on June 7th.

On June 7th at 8:30 AM, Ms. Metcalf and I arrived at the facility where we were met by Clay Thomas and Torin Hasz from Hecla. We presented our DEQ identification and provided our business cards to Mr. Thomas. I requested our access to conduct the inspection. Mr. Thomas granted our access and he and Mr. Hasz accompanied us throughout the inspection.

Mr. Thomas explained Hecla's current mining operation activities and said that as a result of a labor union strike in March 2017 at Hecla's Lucky Friday Mine, the facility has operated, minimally, and is currently operating as a Very Small Quantity Generator (VSQG). He said that when the strike is settled, facility operations will once again generate SQG amounts of hazardous waste.

Owing to the facility's change in generator status, Ms. Metcalf and I inspected the facility as a VSQG.

The facility is comprised of equipment and supply storage, sample preparation area, a wet lab, fire assay room and waste storage area.

Wet Lab

We observed the storage of chemical products, primarily acids, under a fume hood. Typically, the lab would generate small amounts of lead-contaminated acidic liquid waste. At the time of the inspection, no hazardous waste was observed stored in the lab.

Preparation Area

Ore samples are prepped for size reduction and the addition of fluxing reagents prior to assaying. No hazardous waste was observed in this area.

Fire Assay Room

The majority of hazardous waste generated within the facility is derived from assaying mineral ore samples. The prepared samples are placed in crucibles and placed into the furnace for heating. The resultant lead button is further treated when placed into a cupel and reheated. As the lead oxidizes in the furnace, it is driven into the cupel, leaving a bead of metal behind. Though waste crucibles may not be regulated as hazardous waste, the cupels definitely exhibit the toxicity characteristic for lead. Typically, when discarded, the waste crucibles are stored in the same container as the waste cupels.

Waste Storage Area

We observed two 55-gallon containers of waste cupels/crucibles; one full container and the other one partially-filled. Though not required under VSQG rules, the facility had marked each container with hazardous waste labels. We explained the new requirement for all waste containers to be marked with Globally Harmonized System (GHS) labels, once the facility's

status returned to SQG. Currently, as VSQG, GHS container labeling is not required. The containers were observed closed.

Paperwork Review

I requested to review manifests and Land disposal Restriction (LDR) notification forms from previous offsite shipments of hazardous waste. No discrepancies were observed with our review.

Closing Conference:


I completed the Preliminary Inspection Findings (PIF) report form and DEQ's VSQG checklist. We discussed a potential option for the facility to continue operating as a VSQG, once the mine's production was restored, by utilizing "episodic generation". However, Mr. Thomas thought this unlikely and said the lab would once again be managed as a SQG. We provided copies of *Idaho Hazardous Waste Generator Requirements Summary*. At the conclusion of the close out conference I explained DEQ's enforcement response policy. The PIF was signed, but owing to the lack of a copier at the lab, I subsequently emailed copies of the PIF and VSQG checklist to Mr. Thomas. We departed the facility shortly thereafter.

Summary:

A routine hazardous waste compliance inspection was conducted at Hecla Gem Assay Lab on June 7, 2018. The facility is currently generating VSQG amounts of hazardous waste, primarily due to a strike at Hecla's Lucky Friday Mine. No violations of the HWMA/RCRA or the Idaho Rules and Standards for Hazardous Waste were observed at the time of the inspection.



Brian Gaber
Senior Hazardous Waste Inspector
State Technical Services Division
Idaho Department of Environmental Quality



Date



VSQG

Idaho Department of Environmental Quality

Very Small Quantity Generator Checklist

Very Small Quantity Generator (VSQG) – Idaho Administrative Procedures Act 58.01.05.006 [40 CFR 262.13]: The generator who produces less than or equal to 100 kg (220 lb) of non-acute hazardous waste; and 1 kg (2.2 lb) of acute hazardous waste; and 100 kilograms (220) of any residues from a cleanup of acute hazardous waste in a calendar month and accumulates less than 1,000 kg (2,200 lb) of hazardous waste or 1 kg (2.2 lb) acute hazardous waste on site.

Facility Name:	Hecia Gem Assay		
EPA ID No:	IDR000206300	Start Date:	6/7/2018

If any item on the checklist is (or may be) applicable, but was not inspected, check the "NI" column.

NOTE: Compliant answers shaded/underlined.

	Y	N	NA	NI
(1) Less than or equal to 100 kg HW (1 kg acute HW) generated in a calendar month AND less than 1,000 kg HW (1 kg acute HW) accumulated on site? [40 CFR 261.5]	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
NOTE: If NO, then NOT a VSQG. Skip remainder of VSQG checklist.				
(2) Hazardous waste (HW) determinations performed for solid waste streams? [40 CFR 262.11]	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(3) HW managed in on-site neutralization/wastewater treatment/totally enclosed unit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
(4) HW managed in an on-site recycler?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
NOTE: If (4) is NO, skip to (5).				
(4a) HW managed without prior storage/accumulation?	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(5) HW managed off-site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
NOTE: If (5) is NO, skip to (6)				
(5a) HW managed at a permitted/interim status facility?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(5b) HW managed at a municipal landfill?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
(5c) HW managed at a legitimate recycler?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
NOTE: If (5) is YES, then at least one of (5a), (5b), (5c) must also be YES to be in compliance.				
(5d) HW managed at a LQG under the same control as the VSQG?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
(5d1) IF YES: HW containers marked "Hazardous Waste"?	<input type="checkbox"/>	<input type="checkbox"/>		
(5d2) HW containers marked with an indication of hazard? (NFPA diamond, pictogram, HW characteristics, etc.)	<input type="checkbox"/>	<input type="checkbox"/>		
(6) HW treated, stored, used, and disposed of properly, per Idaho Code §39-4408?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
(7) If HW treated, stored, or disposed of on-site, facility obtained permit per Idaho Code §39-4409?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>



VSQG

Idaho Department of Environmental Quality Very Small Quantity Generator Checklist

Alternate Standards for Episodic Generation [Subpart L]

VSQG may maintain existing generator category for HW generated during an episodic event, [40 CFR 262.232]

If any item on the checklist is (or may be) applicable, but was not inspected, check the "NI" column.

NOTE: Compliant answers shaded/underlined.

	Y	N	NA	NI
(8) HW managed for an episodic event?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
NOTE: If NO, Skip remainder of VSQG checklist.				
IF YES, the following conditions must be met to comply.				
(9) HW managed from one (1) <u>planned</u> episodic event per calendar year?	<input type="checkbox"/>	<input type="checkbox"/>		
DEQ notified ≤ 30 days prior to initiating a planned episodic event, using EPA Form 8700-12?	<input type="checkbox"/>	<input type="checkbox"/>		
(10) HW managed from an <u>unplanned</u> episodic event per calendar year?	<input type="checkbox"/>	<input type="checkbox"/>		
For an unplanned episodic event, DEQ was notified ≤ 72 hours via phone, email or fax and <u>submitted</u> EPA Form 8700-12? [40 CFR 262.232(a)(2)]	<input type="checkbox"/>	<input type="checkbox"/>		
(11) Obtained EPA ID Number? [40 CFR 262.232(a)(3)]	<input type="checkbox"/>	<input type="checkbox"/>		
(12) <u>Accumulation</u> : Prohibited from accumulating HW from an episodic event on drip pads and in containment buildings. When accumulating HW in containers and tanks the following conditions apply:				
Containers: VSQG accumulating in containers must mark or label with the following:				
(12a) "Episodic Hazardous Waste"?	<input type="checkbox"/>	<input type="checkbox"/>		
(12b) An indication of the hazards of the contents (i.e., HW characteristics, DOT placard, pictogram, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>		
(12c) Date episodic event began, clearly visible on each container?	<input type="checkbox"/>	<input type="checkbox"/>		
Tanks: VSQG accumulating in tanks must do the following:				
(12d) Mark or label the tank with the words "Episodic Hazardous Waste"?	<input type="checkbox"/>	<input type="checkbox"/>		
(12e) Mark or label its tanks with an indication of the hazards of the contents (i.e., HW characteristics, DOT placard, pictogram, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>		
(12f) Use inventory logs, monitoring equipment or other records to identify the date upon which each episodic event begins?	<input type="checkbox"/>	<input type="checkbox"/>		
(12g) Keep inventory logs or records with the above information on site and readily available for inspection?	<input type="checkbox"/>	<input type="checkbox"/>		
HW must be managed in a manner that minimizes the possibility of a fire, explosion, or release of HW or HW constituents to the air, soil or water.				
(12h) (1) Containers in good condition and compatible with the HW being accumulated therein?	<input type="checkbox"/>	<input type="checkbox"/>		

VSQG



Idaho Department of Environmental Quality Very Small Quantity Generator Checklist

If any item on the checklist is (or may be) applicable, but was not inspected, check the "NI" column.

NOTE: Compliant answers shaded/underlined.

	Y	N	NA	NI
(2) Containers kept closed except to add or remove waste?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(12i) (1) Tanks in good condition and compatible with the HW being accumulated therein?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(2) Tanks have procedures in place to prevent overflow (e.g., equipped with a means to stop inflow with systems such as waste feed cutoff system or bypass system to a standby tank when HW is continuously fed into the tank)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(3) Tanks inspected at least once each operating day to ensure all applicable discharge control equipment such as waste feed cutoff systems, bypass systems, and drainage systems are in good working order and to ensure its operating according to design by reviewing data gathered from monitoring equipment (e.g., pressure and temperature gauges) from the inspection?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(13) VSQG complies with the hazardous waste manifest provisions of subpart B of this part when it sends episodic event hazardous waste off site to a designated facility, as defined in 260.10 of this chapter?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(14) VSQG manifests and sends its hazardous waste generated from the episodic event to a designated facility, as defined in 260.10 of this chapter ≤ sixty (60) calendar days from the start of the episodic event?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(15) VSQG must maintain the following records for three (3) years from the end date of the episodic event:				
(15a) Beginning and end dates?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(15b) A description of the event?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(15c) A description of the types and quantities of HW generated during the event?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(15d) A description of how the HW was managed as well as the name of the RCRA-designated facility that received the HW?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(15e) Name(s) of HW transporters?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
(15f) An approval letter from DEQ if the generator petitioned to conduct one <u>additional</u> episodic event per calendar year?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		



VSQG

Idaho Department of Environmental Quality Very Small Quantity Generator Checklist

Comments:

End of VSQG Checklist

Definitions – 40 CFR 262.231

Below are definitions applicable to 40 CFR Part 262, Subpart L – Alternative Standards for Episodic Generation.

Episodic event means an activity or activities, either planned or unplanned, that does not normally occur during generator operations, resulting in an increase in the generation of hazardous wastes that exceeds the calendar month quantity limits for the generator's usual category.

Planned episodic event means an episodic event that the generator planned and prepared for, including regular maintenance, tank cleanouts, short-term projects, and removal of excess chemical inventory

Unplanned episodic event means an episodic event that the generator did not plan or reasonably did not expect to occur, including production process upsets, product recalls, accidental spills, or "acts of nature," such as tornado, hurricane, or flood.

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Gem No 3 BUR190

SITE VISIT FIELD CHECKLIST - Human Health Mine and Mill Sites
(Windshield Survey or Initial Survey to Determine Sampling Needs)

Site ID: BUR190 Site Name: Gem No. 3
Date/Time: 9/24/14 15:00 Field Team: Shelley Hicks, Abe Hanna, Jan Olsen
Watershed: South Fork CDA River Weather: Sunny, 75°

General Information

Method to Locate Site:
GPS ☐ Field Map ☒ Existing Info ☐ Other ☐

Access to Site:
Paved Road ☐ Improved Road ☒ 4WD Only ☐ Trail ☐ No Trail ☐ Other ☐

Site Features Consistent with Available Information: Yes ☒ No ☐ NA ☐
If No, Describe: _____

Site/Local Terrain:
Rolling/Flat ☐ Foothills ☐ Mountains ☒ Steep/Narrow Canyon ☒

Local Undisturbed Vegetation (check all that apply):
Weeds/Grass ☒ Brush ☒ Riparian/Marsh ☐ Deciduous Trees ☒ Pine/Spruce/Fir ☒

Comments: Same access as Gem Mill Site. Area is open with no access controls. Immediately adjacent to several residential properties.

Receptors/Public Use/Presence

Nearest Resident (direction and distance, upgradient/downgradient, type: house, cabin, temporary structure):
150' SW (upgradient) is house that is part of residential neighborhood accessed from Gem Hill Rd. (crosses site). Gem Mill Site.

Residential Use:
☒ High (on-site, immediately adjacent, or within 200 feet of site)
☐ Moderate (within 1,000 feet of site, upgradient of residential area)
☐ Low (Little, if any, evidence for current residential use)

Recreational use:
☒ High (Visitors observed or evidence such as tire tracks, trash, graffiti, fire rings, etc.; good access to site)
☐ Moderate (Some evidence of visitors and site is accessible from a poor road or trail)
☐ Low (Little, if any, evidence of visitors and site is not easily accessible)

Nearest Observed Recreation (description and distance): Local residence arrived on site during site visit and unloaded scrap wood and couch onto refuse pile located on Gem Mill site. Evidence of camping (fire pit and seating area) observed within cement foundations on Gem No. 3 site.

Nearest Surface Water:
Onsite ☐ 0-200 feet ☒ 200 feet-2miles ☒ >2miles ☐

Type of Surface Water:
Stream ☒ Pond ☐ Wetland/Bog ☐ Adit Discharge ☐ Seep ☐ Spring ☐

Erosion and Runoff Pathways: High precipitation and snow melt may cause local mobilization of tailing. However, no evidence of significant erosion was observed. Tailings are fines but caked/cemented so low likelihood of wind erosion.

Decision Process to Determine If Sampling Needs to be Conducted

Sources: Describe on-site sources (waste piles, adits, other). Tailings pile located uphill from cement foundations. Gravel/tailings mixed material located within cement foundations footprint.

Pathways: Describe migration pathways for soil and surface water. Is there a likelihood for migration during current conditions, high precipitation, other? Where is the probably point of entry for surface water? Low likely hood of wind or water migration.

Receptors: Summarize potential receptors. Human contact from people using the site for recreation.

Describe Potential Sampling Locations

Key Source Points (waste pile(s) or surface water from adit): Tailings and Gravel/Tailing mixed material.

Suggestions for **number of samples** to characterization sources (e.g., size of waste piles): ISM (30 sub-sample) at tailings pile and gravel/tailings mix. Sample separately. XRF screened (reading in field notebook).

Probable Point of Entry into Surface Water: none

Downstream (at least 100 feet):

If windshield survey and applicable information can be gathered, fill out supporting forms for Mine/Mill Waste, Structures, Photo Log and Site Map.

If initial survey determines proceeding with sample collection, then fill out all applicable supporting forms.

Mine Openings

Opening ID (i.e. 1, 2, 3)	NONE		
Opening Type			
Opening Height (ft)			
Opening Width (ft)			
Latitude			
Longitude			
Condition			
Water			
Discharge Point			
Indicators of Metal Release			
Sample ID			
Sample Date/Time			
Sample Latitude			
Sample Longitude			
Flow (gpm)			
Method of Measurement			

Comments

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Types of Openings: ADIT, SHAFT, PIT=Open pit/trench, HOLE=Prospect Hole, WELL=Well

Condition: INTACT = intact, PART = partially collapsed or filled, COLP = filled or collapsed, SEAL = Adit plug,

GATE = Gate barrier

Water: NO = No water or indicators of water, FLOW = Water flowing, INTER = Indicators of intermittent flow,

STAND = Standing water only

Discharge Point: INF=Infiltrates and doesn't emerge, STREAM=Stream, SW=Surface water other than stream

Indicators of Metals (Include all that apply): NO=None, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present

Method Measurement: EST=Estimate, BUCK=Bucket and time, METER=Flow meter

Mine/Mill Waste

Waste ID (i.e., 1, 2, 3)	1	2	
Waste Type	MILL	MILL (mix)	
Area			
Approx. Volume			
Size of Material	FINE	FINE + GRAVEL	
Wind Erosion	LOW	LOW	
Vegetation	BARREN	BARREN	
Surface Drainage	NO	NO	
Indicators of Metals	VEG, STAIN	VEG, STAIN	
Stability	VEG, STA LOW	LOW	
Location with Respect to Floodplain	OUT	OUT	
Distance to Stream	300'	250'	
Sample ID			
Sample Date/Time			

Comments

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Waste Type WASTE=Waste rock dump, MILL=Mill tailings, SPOIL=Overburden or spoil pile, HIGH=Highwall,

PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon, ORE=Ore Stockpile, HEAP=Heap leach

Size of Material (if composed of different size fractions, enter the sizes that are present in significant amounts):

FINE=finer than sand, SAND=sand, GRAVEL=>sand and <2", COBBLE=2"-6", BOULD=>6"

Wind Erosion, potential for. HIGH=Fine, dry material that could easily become airborne, airborne dust, or windblown deposits. MOD=Moderate, some fine material, or fine material that is usually wet or partially cemented. LOW=Little if any fines, or fines that are wet year-round or well cemented.

Vegetation (density on waste): DENSE=Ground cover >75%, MOD=Ground cover 25%-75%, SPARSE=Ground cover <25%, BARREN=Barren

Surface Drainage (Include all that apply): RILL=Surface flow channels mostly <1' deep, GULLY=Flow channels >1' deep, SEEP=Intermittent or continuous discharge from waste deposit, POND=Seasonal or permanent ponds on feature, BREACH=Breached, NO=No indicators of surface flow observed

Indicators of Metals (Include all that apply): NO=None, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present

Stability: EMER=Imminent mass failure, LIKE=Potential for mass failure, LOW=Mass failure unlikely

Location with Respect to Floodplain: IN=In contact with normal stream, NEAR=In riparian zone or floodplain, OUT=out of floodplain

Structures

Type	MINE		
Number	1		
Condition	BAD		

Comments: foundations only

Codes Applicable for all Entries: NA = Not applicable, UNK = Unknown, OTHER = Explain in comments, NO = NO or none

Type: CABIN=Cabin or community service (store, church, etc.), MILL=Mill building, MINE=building related to mine operation, STOR=Storage shed, FLUME=Ore chute/flume or tracks for ore transport

Number: Number of particular type of structure all in similar condition or length in feet

Condition: GOOD=all components of structure intact and appears stable, FAIR=most components present but signs of deterioration, POOR=major component (roof, wall, etc.) of structure has collapsed or is on the verge of collapsing, BAD=More than half of the structure has collapsed

Additional comments/observations not otherwise covered:

6" diameter steel pipe adjacent to tailings pile runs downslope - underground at base of hill. Pipe is badly corroded on outside. A new coupling has recently been placed on the pipe.

Description of Observed Exposure Pathways:

Description of Potential Receptors:



Photo 1: Mill site looking north.



Photo 2: Mill site looking northeast.



Photo 3: Mill site old foundation.



Photo 4: Mill site looking southwest.



Photo 5: Mill site looking west (private garage).



Photo 6: Mill site being used for trash burning.



Photo 7: Old electrical building on site.



Photo 8: Old trammel on site.



Photo 9: ATV tracks up the mine dump.



Photo 9A: ATV tracks up the mine dump.



Photo 10: ATV tracks up the mine dump.



Photo 11: ATV tracks and remediated rail ROW.



Photo 12: ATV tracks and remediated rail ROW.



Photo 13: Looking S across site from mid-road.



Photo 14: ATV trail, remediated road, and Canyon Ck.



Photo 15: Contaminated/stained area by electrical bldg.



Photo 16: Waste pile from mid-road looking east.



Photo 17: Mine dump above mill site with jig tailings.



Photo 18: Waste pile on hillside above mill site.



Photo 18A: Waste pile on hillside above mill site.



Photo 19: Old fire hydrant above mill site.



Photo 20: Above mine dumb, Gem Hill Road looking N.



Photo 21: Inside mill foundation wall looking NE.



Photo 22: Child's blanket inside mill foundation wall.

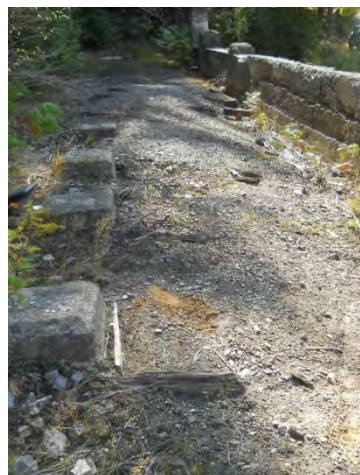


Photo 23: Inside mill foundation wall looking SW.



Photo 24: Old mill site foundations.



Photo 25: Old mill site foundations looking SW.



Photo 26: Old mill site.



Photo 27: Remediated road south end of site.



Photo 28: ATV tracks on face of mine dump.



Photo 29: North end of waste dump from mid-level.



Photo 30: Revegetation of mine dump slope.



Photo 31: Revegetation of mine dump slope.

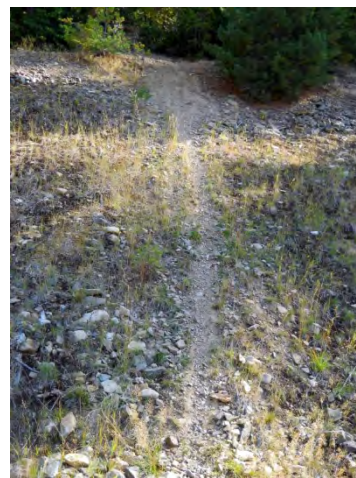


Photo 32: Dirt bike track up face of upper waste dump.



Photo 33: Overview of lower portion of site.



Photo 34: Exposed waste above electrical building.



Photo 35: Steel pipe below upper tailings pile.



Photo 36: Coarse rock below upper tailings pile.



Photo 37: View of trash pile from upslope.



Photo 38: Looking down face of tailings pile.



Photo 39: Looking down face of tailings pile.



Photo 40: Vegetation at south end of site.



Photo 41: Overgrown road above site.



Photo 42: Overgrown road above site.

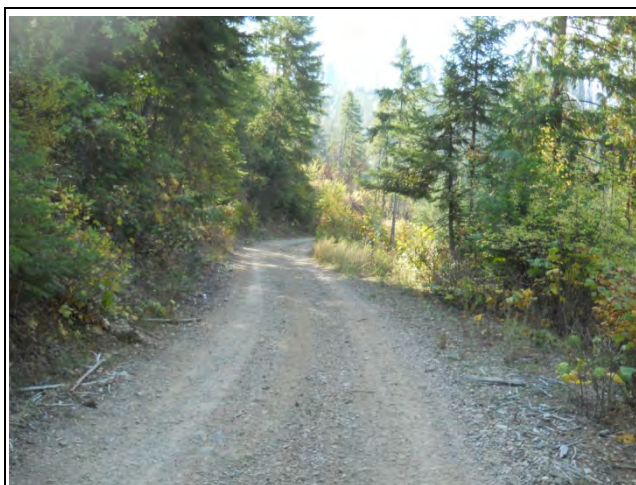


Photo 43: Gem Hill Road



Photo 44: Pipe in embankment above site.



Photo 45: Looking down face of waste dump.



Photo 46: Upper waste pile.



Photo 47: Hillside at north end of site.



Photo 48: XRF shot location on mill foundation tailings.



Photo 49: Erosion of tailings down hillside.



Photo 50: Steel pipe adjacent to upper tailings.



Photo 51: XRF shot location in foundation tailings.



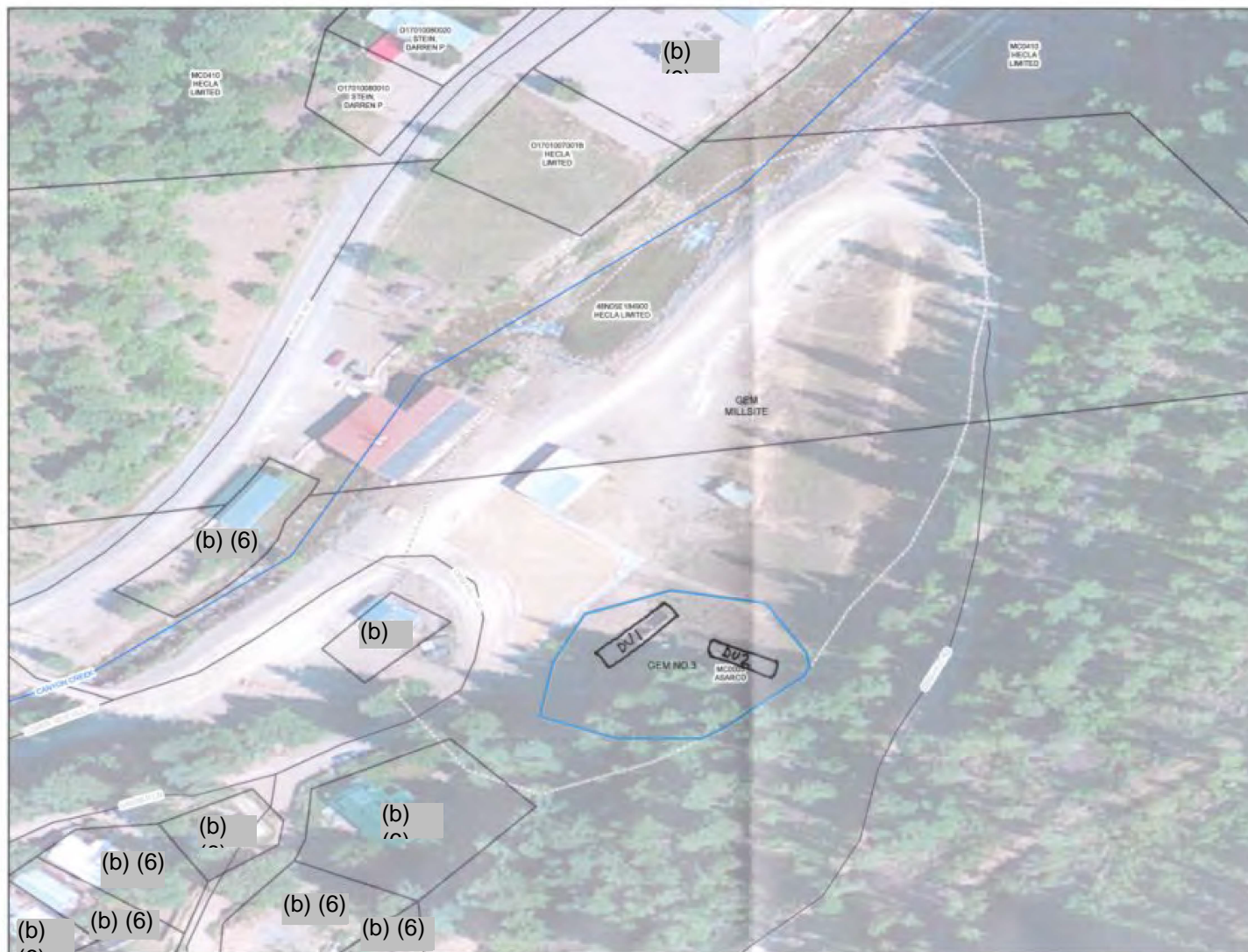
Photo 52: Entry path to inside portion of mill foundation

BUR142: Gem Mill Site
BUR190: Gem No. 3

Site Pictures



Photo 53: Field crew taking XRF shot.



Mine and Mill Site Assessment 2015

**Gem No. 3
BUR 190**

- In-Situ XRF Sample Location
- X Adit
- Vehicle Shaft
- Culvert
- Rock Dump Boundary
- Parcel Boundary
- Mine and Mill Site Boundary
- Road
- Stream

2 DUs - tailings
DUI - triplicate
BUR190-DU1-SS1
SS2
SS3

DU2
BUR190-DU2-SS1

Map Date: 8/11/14
Cartographer: Abe Hanna



TerraGraphics
Environmental Engineering, Inc.

This map was produced using information obtained from several different sources that have not been independently verified. These sources have also not provided information on the precision and accuracy of the data. Information on this map is not a substitute for survey data.



Photo 0967: DU1 overview.



Photo 0968: DU1 overview.



Photo 0969: DU1 sampling.



Photo 0970: DU2 overview.



Photo 0971: DU2 overview.



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Attachment B
Site Windshield Survey

Site A: Frisco No 3 BUR191, Burke Road, Parcel 48N05E180200

Previously Known As: Frisco Mine

Description: Looks to be a hillside disturbance with tailings and a visible adit entrance.



Site B: Gem Mill Site BUR142, Burke Road, Parcel 48N05E184950

Previously Known As: Gem Mill Site

Description: Old mill site foundations.



Site C: Hecla Gem Assay Lab, 3576 Burke Road, Wallace, ID 83873, Parcel 48N05E184950

Previously Known As: Hecla Gem Assay Lab

Description: Functional Assay Lab.



Site D: Gem No 3 BUR190, Burke Road, Wallace, ID 83873, Parcel 48N05E184950

Previously Known As: Burke Road Vacant Lot

Description: An old trammel on site.



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Appendix D

ARARs

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Appendix D - Table A

Chemical Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Water Quality				
IDAPA 58.01.02	Idaho Water Quality Standards and Wastewater Treatment Requirements	Designates uses of waters of the state and water quality standards protective of those uses. This regulation adopts water quality criteria for individual chemicals based on protection of beneficial uses.	Not Applicable - Water quality requirements in Idaho are typically regulated through NPDES permitting. The project site is not located within an urbanized area, and would not require an NPDES permit for municipal stormwater discharge. The project would not require a construction general permit because the disturbed area is less than one acre.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater best management practices (BMPs), and install permanent erosion and sediment control measures to minimize water quality impacts.
33 U.S.C. 1251 et seq., 40 CFR 131	Clean Water Act "Water Quality Standards," National Recommended Water Quality Criteria--2006	Establishes numeric water quality criteria for the protection of human health and aquatic organisms. Toxic criteria for the protection of aquatic life are provided in the water quality criteria regulations [40 CFR 131.36(b)(1)], which supersede criteria adopted by the state except where the state criteria are more stringent than the federal criteria.	Not Applicable - Water quality requirements in Idaho are typically regulated through NPDES permitting. The project site is not located within an urbanized area, and would not require an NPDES permit for municipal stormwater discharge. The project would not require a construction general permit because the disturbed area is less than one acre.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts.
66 FR 18935-18936 (April 12, 2001) Clean Water Act Section 304(a)(1)	Federal Register: Volume 66, No. 71: Notice of Availability of 2001 Update: Aquatic Life Criteria Document for Cadmium	These criteria represent the latest scientific knowledge and better protect aquatic organisms (e.g., bull trout found in the Coeur d'Alene River). The freshwater final chronic value is 0.15 µg/L dissolved cadmium at 50 mg/L total hardness. The freshwater final acute value is 1.0µg/L dissolved cadmium at 50 mg/L total hardness.	Not Applicable - Water quality requirements in Idaho are typically regulated through NPDES permitting. The project site is not located within an urbanized area, and would not require an NPDES permit for municipal stormwater discharge. The project would not require a construction general permit because the disturbed area is less than one acre.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts.

Appendix D - Table A**Chemical Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
33 USC § 1314 (Clean Water Act Section 304(a)(1))	Revised Ambient Water Quality Aquatic Life Criteria for Cadmium	Section 304 (a)(1) of the Clean Water Act requires EPA to develop, publish, and revise criteria for water quality accurately reflecting the latest scientific knowledge. The criteria presented in 66 FR 18935-18936 represent the latest scientific knowledge and better protect aquatic organisms(e.g., bull trout found in the Coeur d'Alene River). The freshwater final chronic value is 0.15 µg/L dissolved cadmium at 50 mg/L total hardness. The freshwater final acute value is 1.0 µg/L dissolved cadmium at 50 mg/L total hardness.	Not Applicable - Water quality requirements in Idaho are typically regulated through NPDES permitting. The project site is not located within an urbanized area, and would not require an NPDES permit for municipal stormwater discharge. The project would not require a construction general permit because the disturbed area is less than one acre.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts.
42 USC § 9621 (d)(2)(B)(i)	CERCLA--Hazardous Substances Releases, Liability, and Compensation: Cleanup Standards	In determining whether or not any water quality criteria under the Clean Water Act [33 U.S.C. 1251 et seq.] are relevant and appropriate under the circumstances of the release or threatened release, the President shall consider the designated or potential use of the surface or groundwater, the environmental media affected, the purposes for which such criteria were developed, and the latest information available. The criteria presented in 66 FR 18935-18936 represent the latest information available and better protect aquatic organisms (e.g., bull trout found in the Coeur d'Alene River). The freshwater final chronic value is 0.15 µg/L dissolved cadmium at 50 mg/L total hardness. The freshwater final acute value is 1.0 µg/L dissolved cadmium at 50 mg/L total hardness.	Not Applicable - Water quality requirements in Idaho are typically regulated through NPDES permitting. The project site is not located within an urbanized area, and would not require an NPDES permit for municipal stormwater discharge. The project would not require a construction general permit because the disturbed area is less than one acre.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts.

Appendix D - Table A**Chemical Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 58.01.08	Idaho Rules for Public Drinking Water Systems	Adopts national primary drinking water regulations that are no less stringent than the federal regulations in effect under 40 CFR Part 141. These rules provide a degree of assurance that public systems that use either groundwater or surface water are protected from contamination and maintained free from contaminants.	Not Applicable - The project involves installing storm drain infrastructure to collect and convey storm runoff and snow melt. No potable water line crossings are anticipated.	Non-potable water pipes will be installed in a manner compliant with this regulation.
42 U.S.C. 300(f) et seq., 40 CFR 141.61, 40 CFR 141.62	Safe Drinking Water Act (SDWA) of 1974, National Primary Drinking Water Standards, and Maximum Contaminant Levels for Inorganic Contaminants	Establishes maximum contaminant levels (MCLs) as criteria for groundwater and surface water that are or may be used for drinking water. The standards are designed to protect human health from the adverse effects of organic contaminants in the drinking water.	Not Applicable - No changes will be made to the local public drinking water system.	N/A

Appendix D - Table A
Chemical Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Air Quality				
40 CFR Part 50	Environmental Protection Agency: National Primary and Secondary Ambient Air Quality Standards	All measurements of air quality that are expressed as mass per unit volume other than for the particulate matter (PM2.5) standards contained in §§50.7 and 50.13 shall be corrected to a reference temperature of 25 (deg) C and a reference pressure of 760 millimeters of mercury. Measurements of PM2.5 for purposes of comparison to the standards contained in §§50.7 and 50.13 shall be reported based on actual ambient air volume measured at the actual ambient temperature and pressure at the monitoring site during the measurement period.	Not Applicable - There is no chemical-specific federal requirement for air quality at the project site. The nearest non-attainment area encompasses west Shoshone County, approximately 13 miles away and it is for PM10 due to residential wood burning.	N/A

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Native American Concerns and Cultural Resources Protection				
42 U.S.C. 1996 et seq.	American Indian Religious Freedom Act	Protects religious, ceremonial, and burial sites and the free practice of religions by Native American Groups.	Applicable	The Trust, MFA, and HRA in consultation with EPA/SHPO/THPO have developed the Cultural Resources Historic Properties Management Plan (HPMP) for the BHSS. This project will be implemented within the guidelines of the HPMP that includes an Unanticipated Discovery Plan, which provides a framework for addressing historic preservation concerns in the event that any potential historic or culturally-significant features are revealed during construction of the project.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
25 U.S.C. 3001 et seq ., 43 CFR 10	Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq ., 43 CFR 10)	Protects Native American burial sites and funerary objects. If Native American graves are discovered within remediation areas, project activities must cease and consultation must take place with the affected Tribe. Covered objects may be repatriated by the tribe.	Applicable	The Trust, MFA, and HRA in consultation with EPA/SHPO/THPO have developed the Cultural Resources Historic Properties Management Plan (HPMP) for the BHSS. This project will be implemented within the guidelines of the HPMP that includes an Unanticipated Discovery Plan, which provides a framework for addressing historic preservation concerns in the event that any potential historic or culturally-significant features are revealed during construction of the project.
16 U.S.C. 470 et seq .; 36 CFR Parts 60, 63, 800; and 40 CFR 6.301 (b)	National Historic Preservation Act	Federal agencies must identify possible effects of proposed remedial activities on historic properties (cultural resources). If historic properties or landmarks eligible for, or included in, the National Register of Historic Places exist within remediation areas, remediation activities must be designed to minimize the effect on such properties or landmarks.	Applicable	The Trust, MFA, and HRA in consultation with EPA/SHPO/THPO have developed the Cultural Resources Historic Properties Management Plan (HPMP) for the BHSS. This project will be implemented within the guidelines of the HPMP that includes an Unanticipated Discovery Plan, which provides a framework for addressing historic preservation concerns in the event that any potential historic or culturally-significant features are revealed during construction of the project.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Idaho Statute 67-4601 et seq. and Idaho Statute 67-4101 et seq.	Idaho Preservation of Historical Sites and Idaho State Historical Society	Covers historical sites and districts within the State of Idaho and the excavation of archaeological resources. The Idaho State historical Society is a state agency. It publishes the National Register of Historic Places for Idaho.	Applicable	The Trust, MFA, and HRA in consultation with EPA/SHPO/THPO have developed the Cultural Resources Historic Properties Management Plan (HPMP) for the BHSS. This project will be implemented within the guidelines of the HPMP that includes an Unanticipated Discovery Plan, which provides a framework for addressing historic preservation concerns in the event that any potential historic or culturally-significant features are revealed during construction of the project.
Special Species Status				
16 U.S.C. 1531 et seq.	Endangered Species Act	Requires federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of species designated as threatened or endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.	Applicable - The project involves installing storm drain infrastructure to convey runoff and snow melt to Canyon Creek. The elevation of the site is close to the inhabited elevation for Canada lynx and North American wolverine. However, other factors make the site an unlikely habitat for lynx or wolverine. Bull trout are not found in the SFCDR but are in the CDR, which the SFCDR flows into approximately 25 miles downstream of the project area.	While this ARAR is applicable, the only threatened or endangered species that may be affected by the project is bull trout. The project minimizes impacts to bull trout and their habitat by use of construction BMPs.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
16 U.S.C. 703 et seq.	Migratory Bird Treaty Act	Protects all migratory bird species. It shall be unlawful at any time, by and means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part of any such bird or any part, nest, or egg thereof.	Applicable - There is potential migratory bird habitat in the project area.	If construction is to take place between April 1st and August 1st, the most up to date interpretation of MBTA implementation will be reviewed to determine if a nesting survey is required. At all times, construction and oversight personnel will remain attentive during the proposed work to the potential for existing migratory birds/nests.
66 FR 3853	Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	Encourages federal agencies to integrate migratory bird conservation principles into plans and actions.	TBC - There is potential migratory bird habitat in the project area.	See above.

Appendix D - Table B

Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
16 U.S.C. 668; 50 CFR 22	Bald and Golden Eagle Protection Act	Provides for the protection of the bald eagle and the golden eagle by prohibiting the unpermitted taking, possession, sale, purchase, barter, offer to sell, purchase, or barter, transport, export or import of any bald or golden eagle, alive or dead, including any part, nest, or egg [16 U.S.C. 668(a); 50 CFR 22]. "Take" includes pursue, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb [16 U.S.C. 688(c); 50 CFR 22.3].	Applicable - There is potential migratory bird habitat in the project area.	See above.
16 U.S.C. 661 et seq.; 40 CFR 6.302(g)	Fish and Wildlife Conservation Act of 1980	Requires consultation with the US Fish and Wildlife Service (and the Idaho Department of Fish and Game) when any modification of a stream or other water body greater than 10 hectares is proposed, requires adequate provisions for protections of fish and wildlife, including permanent or temporary mitigation.	Not Applicable - The project area is less than 10 hectares, therefore the requirements are not applicable.	N/A
Wetlands and Floodplains				
33 U.S.C. 401 et seq.; 33 CFR 320-330	Rivers and Harbors Act of 1899	Prohibits unauthorized obstruction or alteration of navigable waters.	Not Applicable - Canyon Creek is not a navigable waterway as defined by this Act.	N/A
33 CFR Part 320	Title 33--Navigation and Navigable Waters, Chapter II - Corp of Engineers, Department of the Army, Department of Defense, Part 320 - General Regulatory Policies	See above.	Not Applicable - See above.	See above.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
33 CFR Part 321	Permits for Dams and Dikes in Navigable Waters of the United States	See above.	Not Applicable - See above.	See above.
33 CFR Part 322.3 (a) and (c)	Permits for Structures or Work in or Affecting Navigable Waters of the United States	See above.	Not Applicable - See above.	See above.
33 USC 403	Obstruction of navigable waters generally; wharves; piers, etc.; excavations and filling in	See above.	Not Applicable - See above.	See above.
33 CFR Part 322.5 (g)	Permits for Structures or Work in or Affecting Navigable Waters of the United States	See above.	Not Applicable - See above.	See above.
33 CFR Part 323.2 (d)(1)ii	Permits for Discharges of Dredged or Fill Material into Waters of the United States	See above.	Not Applicable - See above.	See above.
33 CFR Part 324	Permits for Ocean Dumping of Dredged Materials	See above.	Not Applicable - See above.	See above.
33 CFR Part 325	Processing of Department of the Army Permits	See above.	Not Applicable - See above.	See above.
33 CFR Part 326.4, 326.5 and 326.6	Enforcement	See above.	Not Applicable - See above.	See above.
33 CFR Part 327	Public Hearings	See above.	Not Applicable - See above.	See above.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
33 CFR Part 328.3 (a)(3)	Definition of Waters of the United States	See above.	Not Applicable - See above.	See above.
33 CFR Part 329	Definition of Navigable Waters of the United States	See above.	Not Applicable - See above.	See above.
33 CFR Part 330	Nationwide Permit Program	See above.	Not Applicable - See above.	See above.
33 U.S.C. 1251-1376; 33 CFR Parts 320-330; 40 CFR Part 230	Clean Water Act of 1977 (Sections 404 and 401) - Dredge or Fill Requirements	Establishes requirements that limit the discharge of dredged or fill material into navigable waters and associated wetlands. EPA guidelines for discharge of dredged or fill materials in 40 CFR part 230 specify consideration of alternatives that have less adverse impacts and prohibit discharges that would result in exceedance of surface water quality standards, exceedance of toxic effluent standards, and jeopardy of threatened or endangered species. Special consideration required for "special aquatic sites" defined to include wetlands.	Applicable - Work will take place below the ordinary high water mark of Gem Drainage.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts.
33 USC § 1251-1376	Restoration and maintenance of chemical, physical and biological integrity of the nation's waters	See above.	Applicable - See above.	See above.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
33 USC § 1344 (a)	Navigation and Navigable Waters: Water Pollution Prevention and Control: Permits and Licenses: Permits for dredged or fill materials: Discharge into navigable waters at specified disposal sites.	See above.	Applicable - See above.	See above.
33 CFR parts 320-330	See ARAR discussion under the previous heading for Rivers and Harbors Act of 1988 (33 CFR 320-330)	See above.	Applicable - See above.	See above.
40 CFR Part 230 Section 404 (b)1	Guidelines for Specification of Disposal Sites of Dredged or Fill Material	See above.	Applicable - See above.	See above.
Executive Order 11990; 40 CFR 6.302(a); 40 CFR Part 6, Appendix A	Protection of Wetlands	Requires federal agencies to take action to avoid adversely impacting wetlands, minimize wetland destruction, and preserve the value of wetlands. Also provides for wetlands enhancement and restoration.	Not Applicable - No wetlands were observed within the project area during a field visit by an ecologist.	N/A
Executive Order 11990	Protection of Wetlands (signed May 24, 1977)	See above.	Not Applicable - See above.	N/A

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
40 CFR Part 6.302(a)	Wetlands, floodplains, important farmlands, coastal zones, wild and scenic rivers, fish and wildlife, and endangered species: Wetlands Protection	See above.	Not Applicable - See above.	N/A
Appendix A to 40 CFR Part 6	Statement of Procedures on Floodplain Management and Wetlands Protection	See above.	Not Applicable - See above.	N/A
OSWER 9280.03, May 1994	Considering Wetlands at CERCLA Site Guidance	Provides guidance for considering potential impacts of response actions on wetlands at CERCLA sites.	Not Applicable - No wetlands were observed within the project area during a field visit by an ecologist.	N/A
Idaho Statute 36-201 and IDAPA 13.01.06	Idaho Classification and Protection of Wildlife	The Idaho Department of Fish and Game classifies wildlife as game, protected non-game, endangered, threatened, and species of special concern. None of the protected non-game species of special concern, threatened, or endangered species may be taken or possessed.	Relevant and Appropriate - The project involves installing storm drain infrastructure to convey local drainage.	While this ARAR is applicable, the only threatened or endangered species that may be affected by the project is bull trout. The project minimizes impacts to bull trout and their habitat by use of construction BMPs.

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Executive Order 11988; 40 CFR Part 6, Appendix A	Protection of Floodplains	Requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid the adverse impacts associated with direct and indirect development of a floodplain.	Applicable - Construction will take place within the FEMA Floodplain Zone A for Canyon Creek.	The project includes replacing one culvert crossing within the floodplain. The work will not result in a net placement of fill, therefore it is not anticipated to adversely affect the floodplain. No additional hydraulic analysis is expected to be necessary to meet floodplain requirements.
Hazardous Waste Management				
42 U.S.C. 6901 ; 40 CFR 264.18(b)	RCRA: Location Standards for Hazardous Waste Facilities - 100-Year Floodplains	Hazardous waste treatment, storage, and disposal facilities (TSDFs) located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any 100-year floodplain.	Not Applicable - The project does not include siting a hazardous waste facility.	N/A
Idaho Statute 39-105 and 39-3601 et seq.; IDAPA 58.01.02.800	Idaho Water Quality and Wastewater Treatment Hazardous and Deleterious Material Storage	Hazardous and deleterious materials must not be stored, disposed of, or accumulated adjacent to or in the immediate vicinity of state waters, unless adequate measures and controls are provided to ensure that those materials will not enter state waters as a result of high water, precipitation runoff, wind, storage facility failure, accidents in operation, or unauthorized third-party activities.	Not Applicable - The project does not include the storage of hazardous or deleterious materials.	N/A

Appendix D - Table B**Location Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Idaho Code 39-5801 et seq. IDAPA 58.01.05	Idaho Siting of Hazardous Waste Disposal Facility Idaho Rules and Standards for Hazardous Waste	The remedial action will be designed to satisfy some of the technical criteria in the Idaho Hazardous Waste Siting Management Plan as adopted by the Idaho State Legislature. Consideration will be given in remedy design to general considerations referenced by the Hazardous Waste Facility Siting Act. However, a siting license for an onsite hazardous waste disposal facility is not required.	Not Applicable - The project does not include siting a hazardous waste facility.	N/A

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Title 42 of the 2011 Idaho State Statute	Idaho Water Law	Evaluation of whether: withdrawal of water is for a beneficial use; the new use will damage existing water rights; water supply is sufficient for the purpose of the new use; the application was made in good faith and is not speculative; the applicant has sufficient resource to complete the project; the use does not conflict with local public interests; and the project is consistent with the conservation of water in Idaho.	Not Applicable - The project will not modify the local water supply.	N/A
33 U.S.C. 1251 Sections 301-302 Section 303 Section 304 Section 306 Section 402	CWA/WPCA Effluent Limitations Water Quality Standards Federal Water Quality Criteria National Performance Standards National Pollutant Discharge Elimination System	These regulations govern water quality, including water discharged as part of a remedial process.	Not Applicable - Water quality requirements in Idaho are typically regulated through NPDES permitting. The project site is not located within an urbanized area, and would not require an NPDES permit for municipal stormwater discharge. The project would not require a construction general permit because the disturbed area is less than one acre.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts.

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
33 U.S.C. Section §1251 et seq.; Clean Water Act (CWA)	Clean Water Act, Basics of the Regulatory Process Compliance Enforcement	CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. EPA has implemented pollution control programs such as setting wastewater standards for industry and contaminants in surface waters. CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges.	Not Applicable - See above.	See above.
Effluent Limitations (Sections 301-302)	Section 301; Effluent Limitations and Section 302; Water Quality Related Effluent Limitations	Establishes effluent limitations (including alternative effluent control strategies) for point source which can reasonably be expected to contribute to the attainment or maintenance of such water quality.	Not Applicable - See above.	See above.
Water Quality Standards (Sections 303)	Section 303; Water Quality Standards and Implementation Plans	Establishes procedures to ensure that any water quality standard applicable to interstate waters shall remain in effect unless the Administrator determined that such standard is not consistent with the applicable requirements of the FWPCA.	Not Applicable - See above.	See above.
Federal Water Quality Criteria (Section 304)	Section 304; Information and Guidelines	Requires EPA to develop and publish criteria for water quality accurately reflecting the latest scientific knowledge.	Not Applicable - See above.	See above.

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
National Performance Standards (Section 306)	Section 306; National Standards of Performance	Establishes standard of performance to control of the discharge of pollutants which reflects the greatest degree of effluent reduction which EPA determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.	Not Applicable - See above.	See above.
National Pollutant Discharge Elimination System (Section 402)	Section 402; The National Pollutant Discharge Elimination System	The NPDES permit program regulates point source discharges of pollutants into waters of the United States by setting specific discharge limits for point sources discharging pollutants into waters of the United States and establishes effluent limitations on pollutants of concern; pollutant monitoring frequencies; reporting requirements; schedules of compliance; operating conditions; best management practices; and administrative requirements.	Not Applicable - See above.	See above.
40 CFR 122.26	Storm Water Discharges	Establishes permitting processes and discharge regulations for storm water. Specific requirements under 40 CFR 122.26 for point source discharges of storm water to surface water and provisions for BMPs to prevent sediment run-on and run-off.	Not Applicable - See above.	See above.

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
40 CFR Part 122 Subpart B Section 122.26 (b)(15)	Permit Application and Special NPDES Program Requirements: Storm Water Discharge Associated With Small Construction Activity	Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one and less than five acres.	Not Applicable - See above.	See above.
40 CFR Part 122 Subpart B Section 122.26 (c)(1)(i)	Permit Application and Special NPDES Program Requirements: Storm Water Discharge Associated With Small Construction Activity	Except as provided in §122.26(c)(1) (ii)–(iv), the operator of a storm water discharge associated with industrial activity subject to this section shall provide items A - G.	Not Applicable - See above.	See above.
40 CFR Part 122 Subpart B Section 122.26 (c)(1)(ii)	Permit Application and Special NPDES Program Requirements: Storm Water Discharge Associated With Small Construction Activity	An operator of an existing or new storm water discharge that is associated with industrial activity solely under paragraph (b)(14)(x) of this section or is associated with small construction activity solely under paragraph (b)(15) of this section, is exempt from the requirements of §122.21(g) and paragraph (c)(1)(i) of this section. Such operator shall provide a narrative description of items A - F.	Not Applicable - See above.	See above.

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Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 37.03.07	Idaho Stream Channel Alteration Rules	Governs the alteration of stream channels in Idaho. Establishes rules and minimum standards to specify procedures for processing and considering applications for stream channel alterations.	Applicable - Approximately 93 linear feet of the stream channel will be modified to accommodate replacement of the existing intake and conveyance.	The project specifications require an environmental protection plan that provides substantive compliance with the construction general permit. The project will utilize construction stormwater BMPs, and install permanent erosion and sediment control measures to minimize water quality impacts. The contract documents will require the contractor to comply with these rules.

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 58.01.02.800	Idaho Water Quality Standards and Wastewater Treatment Requirements	Restrictions are placed on the discharge of waste waters and on human activities that may adversely affect water quality in state waters. Under IDAPA 58.01.02.800, hazardous and deleterious materials must not be stored, disposed of, or accumulated adjacent to or in the immediate vicinity of state waters unless adequate measures and controls are provided to ensure that those materials will not enter state waters. Deleterious materials are defined as any non-toxic substances that may cause the tainting of edible species of fish, taste and odors in drinking water supplies, or the reduction of the usability of water without causing physical injury to water users or aquatic and terrestrial organisms. Non-point source activities conducted in a manner that demonstrates a knowledgeable and reasonable effort to minimize resulting adverse water quality impacts are not subject to conditions or legal actions (IDAPA 58.01.02.350.02.a).	Not Applicable - The project does not involve the storage of hazardous or deleterious materials.	N/A
Idaho Non-Point Source Management Plan, Final (December 1999)		Remedial activities should be consistent with the state's goal of restoration, maintenance, and protection of the beneficial uses of both surface water and groundwater. Long-term goals include design and implementation of Best Management Practices for surface water and groundwater.	TBC	Stormwater best management practices are submitted by the contractor and approved by the Trust prior to construction.

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Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Idaho's Nonpoint Source Management Program	Idaho's Nonpoint Source Management Program	Idaho's nonpoint source management program goal is to prevent and eliminate water pollution from nonpoint sources of water pollution in all water bodies in the state by focusing predominantly on implementing water quality activities prescribed in water body improvement plans known as Total Maximum Daily Loads (TMDLs). Activities are designed to protect and restore beneficial uses (such as swimming and fishing) and to prevent significant threats from present and future activities from degrading water quality.	TBC	See above.

Appendix D - Table C**Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 58.01.01	Idaho Air Pollution Control Rules	Requires that remedial activities be designed to take all reasonable precautions to prevent particulate matter from becoming airborne, including the use of water or chemicals as dust suppressants, the covering of trucks, and the prompt removal and handling of excavated materials.	Applicable	The contract documents will require the contractor to perform dust abatement measures to prevent airborne dust. The selected construction contractor will be required to comply with local ICP requirements that address dust control. The selected construction contractor will be required to develop a site control plan that describes provisions the contractor will employ to assure that dust does not become airborne and migrate off the project site. A dust control plan will be required that identifies measures for health, safety, and convenience, and that prevents dust and minimizes wind erosion. The measure shall consist, at a minimum, of the application of water to the disturbed surfaces during the entire construction period.

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 58.01.01.650	Rules for Control of Fugitive Dust	The purpose of Sections 650 through 651 is to require that all reasonable precautions be taken to prevent the generation of fugitive dust.	Applicable - See above.	See above.
IDAPA 58.01.01.651	General Rules	Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.	Applicable - See above.	See above.
42 U.S.C. 7401 et seq	Clean Air Act	Requires minimization of the harmful effects to air quality from excavation, construction, and other removal activities.	Not Applicable - Construction sites do not fall under the regulatory authority of the CAA.	N/A
40 CFR Sections 61.145, 61.149 and 61.150	National Emissions Standards for Asbestos	Any asbestos-containing materials encountered in demolition must be removed and disposed of in accordance with these regulations.	Not Applicable - No asbestos-containing materials are anticipated to be uncovered during construction of this project.	Contract documents require the contractor to follow materials handling and disposal procedures as long as there is more than 260 linear feet of pipe lined with asbestos-containing materials.

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Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
OSWER, 1997	Best Management Practices for Soil Treatment Technologies	Provides technologies for controlling cross-media transfer of contaminants during materials handling activities.	TBC - Contaminated soil will be excavated during the construction of this project.	The contract documents will require the contractor to perform cross-media transfer of contaminants abatement measures. The selected construction contractor will be required to develop a site control plan that describes provisions the contractor will employ to assure that contaminants are handled in an appropriate manner such as described in this document.

Appendix D - Table C**Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project**

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
US EPA, OSWER, EPA530-R-97-007 May 1997 Best Management Practices (BMPs) for Soil Treatment Technologies: Suggested Operational Guidelines to Prevent Cross-media Transfer of Contaminants During Clean-up Activities	BMP for containment technologies	Generally accepted BMPs to minimize cross-media transfer of contaminants during remedial actions or corrective measure implementations when using containment technologies to manage soils or solid media. BMPs are meant only to provide guidance and general recommendations on the operational practices of selected technologies.	TBC - See above.	See above.

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Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 58.01.18.027	Idaho Land Remediation Rules	Institutional controls may be used in instances where residual concentrations of chemicals exceed risk-based health standards, or when they are required to ensure the continued protection of human health and the environment or the integrity of the cleanup action.	Applicable	Although permits are not required for the project under CERCLA, the specifications require the selected construction contractor to secure a permit through the BHSS Institutional Controls Program (ICP). This process will include requirements to develop and follow a site control plan that is in compliance with the ICP, and ensure that all construction activities are conducted in a manner to prevent damage to previously completed remedial actions in the residential areas adjacent to the project.
IDAPA 58.01.18.027.01 (a)	Idaho Land Remediation Rules: Institutional Controls: Purpose	Institutional controls may be proposed by the applicant or the Department as an element of the voluntary remediation work plan.	Applicable - See above.	See above.

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Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 58.01.18.027.03 (a and b)	Idaho Land Remediation Rules: Institutional Controls: Institutional Controls	Institutional controls may include physical measures such as fences and signs, to limit activities that may interfere with the cleanup action or result in exposure to hazardous substances at the site. Institutional controls may also include legal and administrative controls, such as zoning restrictions, restrictive covenants, or equitable servitudes used to ensure such measures are maintained.	Applicable - See above.	See above.
IDAPA 58.01.18.027.05 (a and b)	Idaho Land Remediation Rules: Institutional Controls: Legal Use Restriction Requirements	The legal use restriction requirements should prohibit activities on site that may interfere with a cleanup action, operation and maintenance, monitoring, or other measures necessary to assure the integrity of the cleanup action and continued protection of human health and the environment and prohibit activities that may result in the release of a hazardous substance contained as part of the remediation.	Applicable - See above.	See above.
40 CFR 261.20	RCRA: Subtitle C - Hazardous Waste Characteristics	Generators of solid waste must determine whether the waste is hazardous. A solid waste is hazardous if it exhibits the toxicity characteristic (based on extraction procedure Method 1311).	Not Applicable - Mining waste is not classified as hazardous under RCRA, therefore, this ARAR is not applicable.	N/A
40 CFR 264.554	RCRA: Subtitle C Hazardous Remediation Waste Management (HWIRMedia)	The use of staging piles can facilitate short-term storage of remediation wastes so that sufficient volumes can be accumulated for shipment to an offsite treatment facility or for efficient onsite treatment. The regulations contain performance standards for these piles.	Not Applicable - Mining waste is not classified as hazardous under RCRA, therefore, this ARAR is not applicable.	N/A

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
40 CFR 264 Subparts L and N	RCRA Subtitle C Hazardous Waste Treatment and Storage	Requirements for storing or treating hazardous wastes in landfills and waste piles. Subpart F addresses groundwater monitoring at hazardous waste treatment, storage, and disposal facilities (TSDFs). Closure requirements for hazardous waste repositories are covered under Subpart G. Hazardous waste landfills must meet minimum design standards under Subpart N.	Not Applicable - Mining waste is not classified as hazardous under RCRA, therefore, this ARAR is not applicable.	N/A
42 U.S.C. 6901 et seq.; 40 CFR 257	RCRA: Subtitle D- RCRA Criteria for Classification of Solid Waste Disposal Facilities and Practices	Certain criteria are required to be met by solid waste disposal facilities and practices, such as not restricting the base flow of the floodplain, not taking threatened or endangered species, and not causing a discharge to navigable waters.	Not Applicable - The project does not involve the siting or operation of a Subtitle D facility.	N/A
42 U.S.C. 6901 et seq.; 40 CFR Part 258	RCRA Subtitle D- Disposal of Nonhazardous Solid Waste	Provides criteria for cover material, run-on/runoff control systems, access control, and liquid restrictions.	Not Applicable - The project does not involve the siting or operation of a Subtitle D facility.	N/A

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
30 U.S.C. 1201 et seq., 30 CFR 816	Surface Mining Control and Reclamation Act of 1977 (SMCRA)	Requires the protection of human health and the environment from the adverse effects of current and past surface coal mining operations. Some of the potentially relevant and appropriate requirements for the removal of contaminated surface soil include: --Stabilization of all exposed surface areas to effectively control erosion and air pollution attendant to erosion (30 CFR 816.95) --Use of best technology currently available to (1) minimize disturbances to and adverse impacts on fish, wildlife and related environmental values and to achieve enhancement of such if possible; (2) conduct no activity that may jeopardize the continued existence of endangered species or that is likely to destroy or adversely modify their critical habitat; and (3) avoid disturbances to, enhance where practicable, or restore or replace wetlands, riparian vegetation, and habitats for fish and wildlife (30 CFR 816.97).	Not Applicable - The project does not include any mining activities.	N/A
IDAPA 58.01.06	Idaho Solid Waste Management Rules and Standards	Requires all solid waste be managed to prevent human health hazards, public nuisances, or pollution of the environment. Elements relating to landfill cover, surface water management, and erosion control may be ARARs.	Not Applicable - The project does not involve siting a solid waste facility.	N/A

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
Coeur d'Alene Basin Restoration Project	Mine and Mill Waste Remedial Guidelines and Best Management Practices	Design and implementation of selected response actions should consider a number of factors and techniques for protecting water quality, fish and wildlife habitat while minimizing the potential for human exposure.	TBC	The contract documents will require the contractor to handle the waste in a way that protects water quality and fish and wildlife habitat while minimizing the potential for human exposure.
Best Management Practices and Guidelines for Mine Tailings Repositories		Provides guidelines for location, design, construction, and management of mine waste repositories.	Not Applicable - The project does not involve the construction of a mine waste repository.	N/A
IDAPA 20.03.02.060, .140, .160	Idaho Rules Governing Exploration and Surface Mining-Best Management Practices, Reclamation	Reclamation requirements include best management practices for the protection of water quality, non-point sediment control, clearing and grubbing operations, overburden and topsoil requirements to enhance revegetation of disturbed areas, and road construction requirements to minimize erosion. Additional best management practices are specified for backfilling and grading and revegetation activities.	Not Applicable - The project does not include any mining activities.	N/A

Appendix D - Table C

Action Specific ARARs and TBCs for Human Health and Ecological Receptors in the Upper Basin Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Gem Drainage Remedy Protection Project

Citation	Regulatory Description	Summary of Requirements	Evaluation	How Addressed by the Project
IDAPA 37.03.05	Idaho Mine Tailings Impoundment Structure Rules	Design elements of the regulation may be relevant and appropriate to construction of regional repositories. Construction, enlargement, and alteration of mine tailings impoundments must conform to specific design specifications, spillways or diversion structures, cutoff walls, filters, and embankment slopes.	Not Applicable - The project does not include modifying any mine tailing impoundment structures.	N/A

Appendix E
Hydrologic and Hydraulic Analysis Memorandum

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MEMORANDUM

To: Derek Forseth, Alta Science and Engineering, Inc., Moscow
From: Duncan Pfeifer, Alta Science and Engineering, Inc., Kellogg
Date: May 20, 2019
Job Code: 19010-30-30
Subject: **Hydrologic and Hydraulic Analysis and Design Documentation for the Gem Drainage Remedy Protection Project**

Section 1 Introduction

The purpose of this memorandum is to document the hydrologic and hydraulic analysis and design conducted for the Gem Drainage Remedy Protection Project. The analysis of the proposed stormwater drainage system improvements described in this memorandum was conducted for the final design. Supporting information and calculations are included as attachments to this memo as follows:

- Attachment A – Watershed Map
- Attachment B – Time of Concentration
- Attachment C – Soil Type Data
- Attachment D – SCS Curve Numbers
- Attachment E – Precipitation
- Attachment F – Snowmelt
- Attachment G – StreamStats Analysis Report
- Attachment H – SCS TR-55 Analysis
- Attachment I – Existing Pipe Network Hydraulic Analysis in SSA
- Attachment J – Design Intake Hydraulic Analysis in HY-8
- Attachment K – Design Pipe Network Hydraulic Analysis in SSA

Section 2 Hydrologic Analyses

Hydrologic modeling of the Gem Drainage watershed was conducted using Autodesk's Storm and Sanitary Analysis 2016 (SSA) software with application of the Soil Conservation Service (SCS) Unit Hydrograph transform method and SCS Curve Number loss method. Results were verified using the SCS Technical Release 55 (TR-55) Graphical Method (NRCS, 1986) and the U.S. Geological Survey (USGS) StreamStats program. Both SSA and the SCS Graphical Method require basin characteristics as inputs, which are described in the following sections.

2.1 SSA & SCS Graphical Analyses

The basin characteristics and design assumptions for the SSA analysis and the SCS TR-55 calculations are described in the following sections.

2.1.1 Basin Characteristics

2.1.1.1 Existing Drainage Areas

Attachment A illustrates the delineated Gem Drainage watershed. For analysis, the roughly 162-acre drainage was broken up into only one drainage basin. This drainage basin, denoted as sub-basin A, was delineated using USGS topographic contour data incorporated into AutoCAD Civil 3D 2016 and field observations, and contributes directly into the Gem Drainage system through the intake structure. During this analysis, USGS topographic data identified that the majority of the sub-basin should drain further to the north. Field observations identified that the drainage channel enters an approximately 30 foot deep, heavily vegetated, steep sided ravine and turns to the south (towards the existing Gem Drainage system). The delineation of the watershed was updated using these observations.

2.1.1.2 Times of Concentration

Drainage area Times of Concentration (T_c) were manually calculated using the Natural Resources Conservation Service (NRCS) TR-55 Manual (NRCS, 1986) and the National Engineering Handbook (NEH) May 2010 Edition for sheet flow, shallow concentrated flow, and open channel flow. Potential flow paths, surface roughness, and ground cover conditions were determined from aerial imagery, USGS contour maps, and observations made in the field. Sheet flow values of 150-feet were selected due to steep slopes throughout the watershed. T_c calculation reference materials and spreadsheets showing the calculations are included as Attachment B.

2.1.1.3 Infiltration and Soils

The curve number (CN) for sub-basin A was determined based on the hydrologic soil group and land use. The value was selected from Tables 2-2a in the TR-55 Manual (NRCS, 1986) assuming antecedent moisture condition II (normal moisture conditions), Hydrologic Soil Group B, and several land use types. Hydrologic soil group was obtained from an NRCS soil report (see Attachment C). The CN calculations are included in Attachment D and summarized below in Table 1.

Table 1. Gem Drainage Watershed Composite Curve Number

Sub-Basin	Land Cover	Condition	Land Cover %	Composite CN
A	Woods	Good	79	55
	Woods	Fair	3	
	Brush	Good	16	
	Dirt	-	2	

2.1.2 Precipitation

An SCS Type II, 24-hour storm event was used for hydrologic analyses at the 50-year recurrence interval. Hydrologic calculations were performed for a rain-with-snowmelt runoff event. A cumulative 24-hour precipitation value of 4.0 inches for the 50-year storm event was assigned based upon the isopluvial maps contained within the National Oceanic and Atmospheric Administration (NOAA) Atlas 2, Volume V titled, *Precipitation-Frequency Atlas of the Western United States* (NOAA, 1973). Details regarding determination of this precipitation depth are included in Attachment E.

Snowmelt contribution was applied to the model as a constant base flow and calculated using the U.S. Army Corps of Engineers (USACE) generalized energy budget equation included in the USACE Engineering Manual 1110-2-1406 titled, *Engineering and Design Runoff from Snowmelt* (USACE, 1998). The resulting combined snowmelt base flow was 4.5 cubic feet per second (cfs) for the 50-year event applied to sub-basin A. Design rain and snowmelt input values are summarized in Table 2 below. Snowmelt runoff calculations are included as Attachment F.

2.1.3 Additional Flows

Flow contribution from springs or groundwater was not estimated or included in this hydrologic analysis.

Table 2. Gem Drainage 50-Year Rain and Snowmelt Input Values

Sub-Basin	Area (Acres)	CN	Storm	Rainfall Precip. (in/day)	Snowmelt (cfs)	Tc (mins)
A	162.0	55.0	SCS Type II	4.0	4.5	70.8

Notes:

CN = curve number

in/day = inches per day

cfs = cubic feet per second

Tc = Time of Concentration

mins = minutes

2.2 StreamStats Analysis

StreamStats is a GIS-based tool developed by USGS that provides the drainage-basin boundary, basin characteristics, and estimates of streamflow statistics for any given location along a stream. For ungauged sites it estimates peak flows using a regression equation that is region-specific and based on individual basin characteristics. The point chosen for this project was at the existing Gem Drainage intake at the upstream end of the project site and represents flow from sub-basin A from the SSA hydrologic analysis. See Attachment G for supporting information.

2.3 Hydrologic Analysis Results

Calculated peak runoff rates for the Gem Drainage watershed (sub-basin A) for the three methods used are summarized below in Table 3. Flood routing was not considered in the SCS Graphical method values so they cannot be directly compared to the other values and are likely higher for that reason.

Table 3. Gem Drainage Peak Runoff Comparison

Hydrologic Analysis Method	Q ₅₀ (cfs)	Valid?	Comment
USGS StreamStats	18.4	No	Application and accuracy of this method is not valid for the Gem Drainage watershed based on watershed size.
SCS Graphical w/Snowmelt	32.7	Yes	
SSA w/Snowmelt	31.2	Yes	Selected for design

Notes:

Q₅₀ = 50-year peak flow

cfs = cubic feet per second

The SCS TR-55 Graphical Method, with snowmelt added, resulted in a peak flow value of 32.7 cfs. This calculation was completed as a check for the SSA results (see Attachment H) and was within approximately 1.5 cfs.

In comparison to the other methods, the USGS StreamStats method resulted in a much lower peak runoff. As explained above in Table 3, the Gem Drainage watershed is below the acceptable size range of watersheds for the regression equations.

Section 3 Existing Features Hydraulic Analyses

The following section describes the inputs, assumptions, and results for the hydraulic analyses of the existing Gem Drainage system. Hydraulic modeling was performed utilizing SSA.

3.1 Existing Conveyance System Description

The Gem Drainage creek flows into an existing 18-inch diameter corrugated metal pipe (CMP) located at an on grade 36-inch x 24-inch intake grate, approximately 165 feet north of Burke-Canyon Creek Road. Limitations of the system first become apparent on the northern edge of the developed area for 3475 Burke Road. Through conversations with the homeowner and visual observation, evidence of the gravel parking area and driveway washing out due to creek overflows occurring at the intake was documented from a previous storm event. Once the creek enters the system, it travels from the intake through the backyard of 3475 Burke Road in a southwesterly direction until it reaches the gravel parking area of the residence. Upon reaching the northern edge of the parking area, the 18-inch CMP transitions into an 18-inch Corrugated High-Density Polyethylene pipe (CHDPE) and angles to the southeast redirecting the creek flow.

Also located at this angle point on the northern edge of the parking area is a concrete catchment area where a pond is maintained as a result of groundwater pumping from an adjacent pump house. Providing water for the local residence from a source other than the creek of concern, this pumping operation functions independently from the Gem Drainage creek system, allowing the creek to flow under the pond through the 18-inch CHDPE pipe unimpeded. The junction between the 18-inch CMP and 18-inch CHDPE is not a sealed connection. There is a small opening at the base of the concrete wall of the pond where overflow from the pond is able to drain into the system. There is no cover or grate for this connection.

Maintaining its southeasterly direction, the creek flows through the existing system down the parking area approximately 70 feet where the creek then daylights into an open trapezoidal channel made of native cobble and vegetation. Located between the gravel driveway and an adjacent shed, the channel dimension vary and are approximately 4 feet wide at the top of its banks and 2 feet wide at the bottom and 1 foot deep.

Once in the open channel, the creek flows south towards Burke-Canyon Creek Road for approximately 60 feet in between a riprap retaining wall and the remainder of the gravel driveway until it empties into a 24-inch CMP culvert in the gravel shoulder on the north side of the road and travels back underground. From here, travelling through the approximately 150 foot long 24-inch CMP culvert, the creek flow is redirected again to the southwest where it crosses Burke-Canyon Creek Road. After crossing the road, the culvert conveys the flow underneath a vacant lot to the south between 3456 Burke Road and 3479 Burke Road, where it can then be seen outfalling from the stream bank into Canyon Creek.

3.2 Existing System Hydraulic Analysis in SSA

The following sections describe the inputs, assumptions, and results for the SSA analysis of the existing Gem Drainage conveyance system between the inlet located above 3475 Burke Road and the outlet located in the northern bank of Canyon Creek. SSA was selected for the analysis along this reach due to its simplicity in working with pipe networks and ease of integration with AutoCAD.

3.2.1 Objective

The objective of the hydraulic analysis was to estimate the capacity of the existing Gem Drainage conveyance system from its inlet to the outfall into Canyon Creek.

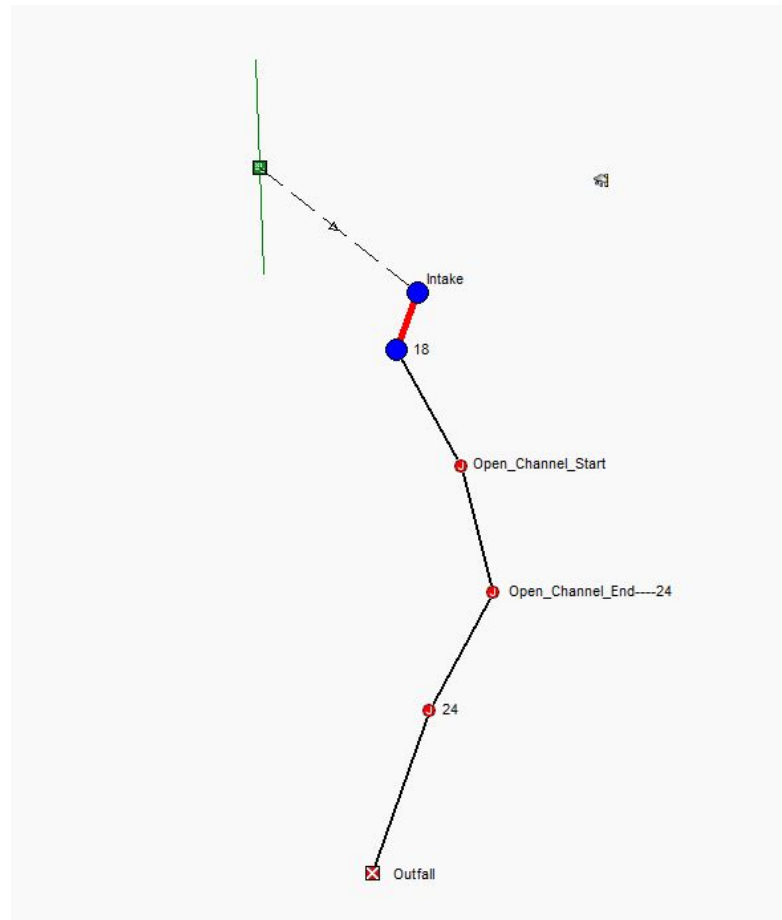
3.2.2 Model Inputs and Assumptions

The existing conveyance network was laid out as a combination of CMP, CHDPE, and open channel sections utilizing Manning's roughness coefficients (n) of 0.024, 0.012, and 0.035 respectively. Other details such as pipe slopes, connections between pipes, debris buildup, and condition of the pipe materials other than what was directly observable from the ground surface are not known. It was also assumed that the pipe network only carried flow coming into the intake, i.e., no external flow from below the intake.

3.2.3 Results

Results indicate that surcharging is likely to occur at the intake and at the angle point on the northern edge of the gravel parking area for 3475 Burke Road where the pipe transitions from 18-inch CMP to CHDPE. In addition, intake calculations performed based on the chapter five guidelines of the Washington Department of Transportation's (WSDOT) hydraulic manual estimated that the existing intake's flow capacity was approximately 23.74 cfs. These complimentary calculations indicate that additional flooding from the intake of approximately 7.46 cfs during the selected design storm event can be expected. Figure 1 below shows the plan view of the model with flooding at the intake and at the 18-inch CMP/CHDPE transition indicated by the large blue dot. A detailed report of the modeling results is included as Attachment I.

Figure 1. Gem Drainage Existing SSA Model Plan View



Section 4 Hydraulic Analyses and Design of Proposed Features

The following section describes the inputs, assumptions, and results for the hydraulic analyses and design of the Gem Drainage intake and storm drain network. Hydraulic modeling was performed utilizing two computer programs; the Federal Highway Administration (FHWA) culvert analysis program HY-8 and SSA, respectively.

4.1 Gem Drainage Intake

The objective of the hydraulic analysis was to size a Gem Drainage intake capable of fully conveying the 50-year rain and snowmelt event to protect the remedy from scour and deposition in and downstream of the project area.

4.1.1 HY-8 Hydraulic Model

The intake was analyzed and designed using the HY-8 Culvert Hydraulic Analysis Program. Model inputs and assumptions are included as Attachment J. A precast concrete headwall and wingwall unit with a 24-inch Polypropylene Pipe (PP) storm drain pipe was selected for design.

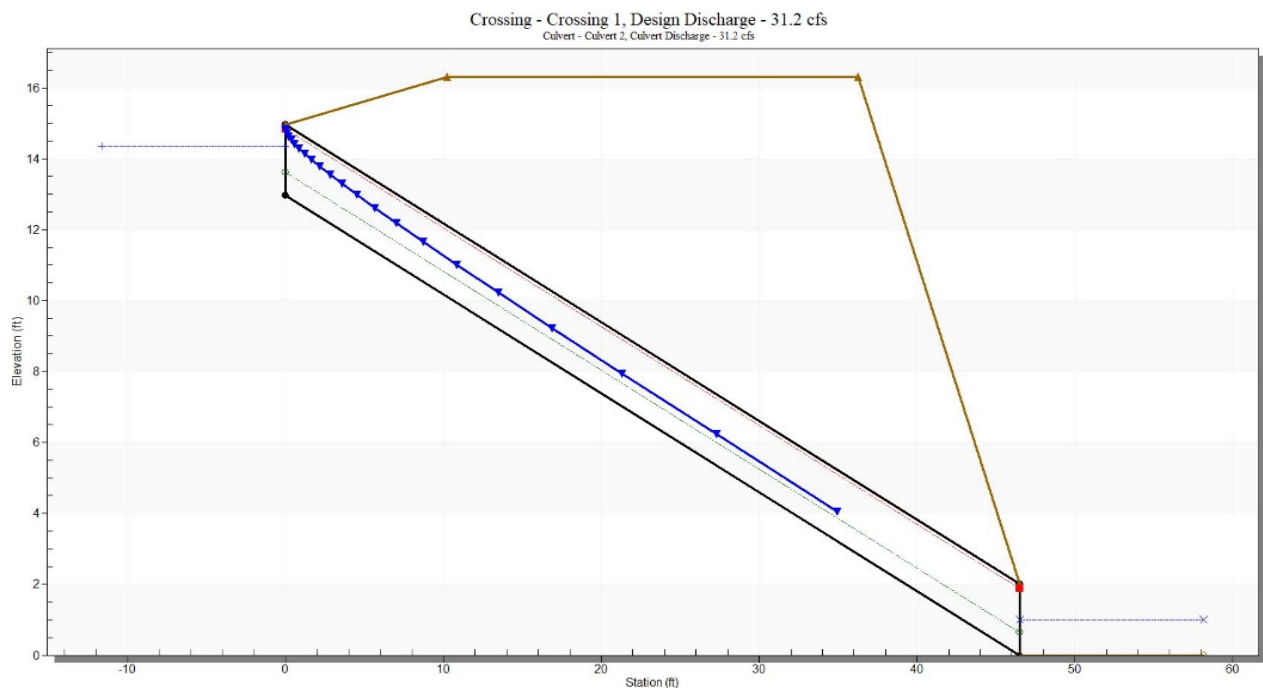
4.1.1.1 Inputs and Assumptions

Tailwater conditions were set at a fixed elevation based on the SSA results for the flood elevation at the downstream manhole (MH). A Manning's n of 0.012 was used for the C905 PVC Pipe.

4.1.1.2 Results

With a slope of approximately 15% to 29%, the pipe was able to pass the design flow without any overtopping of the headwall. Figure 2 below shows the design flow profile. Result tables are included in Attachment J.

Figure 2. HY-8 Design Flow Profile



4.1.2 Proposed Improvements

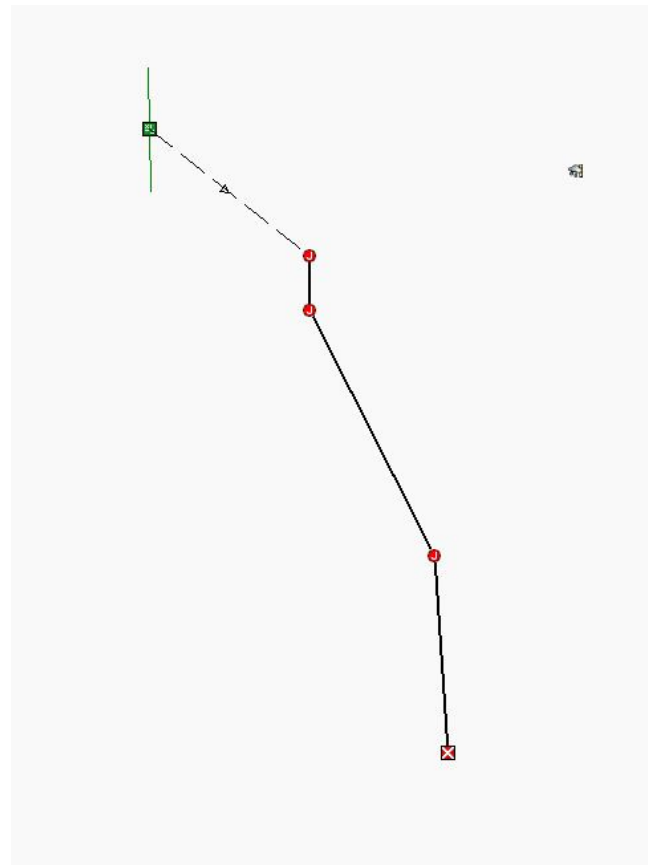
Design features of the Gem Drainage intake are summarized as follows:

- Precast concrete wingwall/headwall intake for 24-inch PP pipe.
- 24-inch PP sloped at 14.58% to 29.00%
- Two Rock Weirs to direct flow with riprap restoration around the intake.

4.2 Gem Drainage Pipe Network Features

The storm drain network was analyzed entirely in one SSA hydrologic/hydraulic model and the plan view of the system is shown below in Figure 3.

Figure 3. SSA Plan View of the Gem Drainage Design Features



4.2.1 Proposed Pipe Network

The storm drain pipe network was exported from AutoCAD and imported into SSA to create the model. Sub-basin A was assigned to the Gem Drainage intake node, which in this model was represented by a simple junction and assumed to convey all flow assigned to it. Model results are included as Attachment K.

4.2.1.1 Design Objectives

The design objectives of the proposed pipe network portion of the design were as follows:

- Collect and convey the Gem Drainage creek flow through local residences
- Upgrade pipe size and material to increase the longevity and functionality of the system
- Re-align sections of the pipe network for easier future access and maintenance by lessening encroachment on private properties
- Remove open channel portion of the system, making the network entirely of underground storm pipe

4.2.1.2 Inputs and Assumptions

The outfall into Canyon Creek was given a fixed invert elevation of 3,228 feet, which was the highest elevation possible that the outfall could be placed without violating minimum pipe cover and Canyon Creek design flood level constraints.

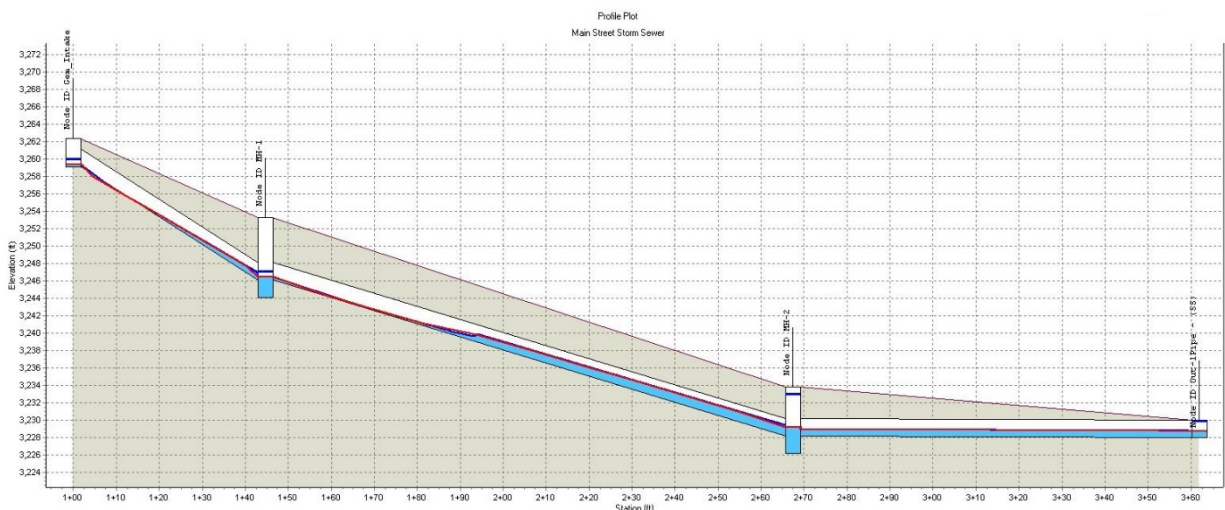
For the pipe sections, entrance and exit losses of 0.5 were selected for each pipe segment. These were picked because the network features small pipe to MH connection angles. The system is comprised of PP resulting in a Manning's 'n' of 0.012.

In terms of network structures, two manholes were used and no additional inlets other than the intake were included in the design. MH-1 and MH-2 were modeled as basic junctions with rim elevations set to the existing surface. MH-2 was given a sump in order to account for some of the excess energy expected in the system at this location due to high flow velocities. A detailed report of the modeling inputs and assumptions is included as Attachment K.

4.2.1.3 Results

Some surcharging was observed in the pipe section between MH-1 and MH-2, as well as surcharging in MH-2 itself. The cause of this flooding is due to the abrupt slope change of the pipe coming into MH-2 as a result of the existing topographic constraints. As mentioned previously, MH-2 was given a sump to help mitigate some of the expected energy that could be created from the severe slope change and high incoming pipe velocities. As for the remainder of the system, the model indicated that the pipe network functioned within its capacity and limited bypass as expected. The peak discharge of the Gem Drainage pipe network at the Canyon Creek outfall was 31.16 cfs. A profile of the design pipe network at peak design flow is shown below as Figure 4. A detailed report of the modeling results is included as Attachment K.

Figure 4. Gem Drainage Design Pipe Network Profile Plot at Peak Design Flow



4.2.1.4 Design Features Summary

Design features of the proposed pipe network are summarized as follows:

- One precast inlet structure with headwall and wingwalls to collect drainage into the design system.
- One 60-inch diameter slab top manhole and one 48-inch diameter slab top manhole (with a 36-inch locking lid) to convey flow from inlet structure to Canyon Creek by 244 linear feet (LF) of 24-inch PP.
- 48 LF of 6" perforated sock drain to collect ground water from filled channel.
- Concrete pipe anchors will be utilized on the pipe segment between the intake and MH-2.

- Concrete thrust blocks on the upstream and downstream sides of MH-1 and MH-2.

4.3 Other Design Features

- 290 square yards of driveway restoration for 3476 Burke Road to pre-washout elevation and grade.
- 140 square yards of gravel surface restoration.
- Approximately 26 square yards of full-width asphalt roadway rebuild along Burke-Canyon Creek Road where the trunk line will be installed to match existing grades.
- Filling in of the existing lower drainage system on 3475 Burke Road (approximately 50 cubic yards)..
- 48 LF of 6-inch perforated sock drain to collect ground water from filled channel.
- Approximately 30 square yards of riprap restoration. This area will include armoring around the design intake and outfall as well as around the existing culvert intake below the residence of 3475 Burke Road and in the shoulder of Burke-Canyon Creek Road.
- Compacted stream material with two rock weirs north of inlet.

Section 5 References

National Oceanic and Atmospheric Administration (NOAA), 1973. Atlas 2, Volume V, *Precipitation-Frequency Atlas of the Western United States*.

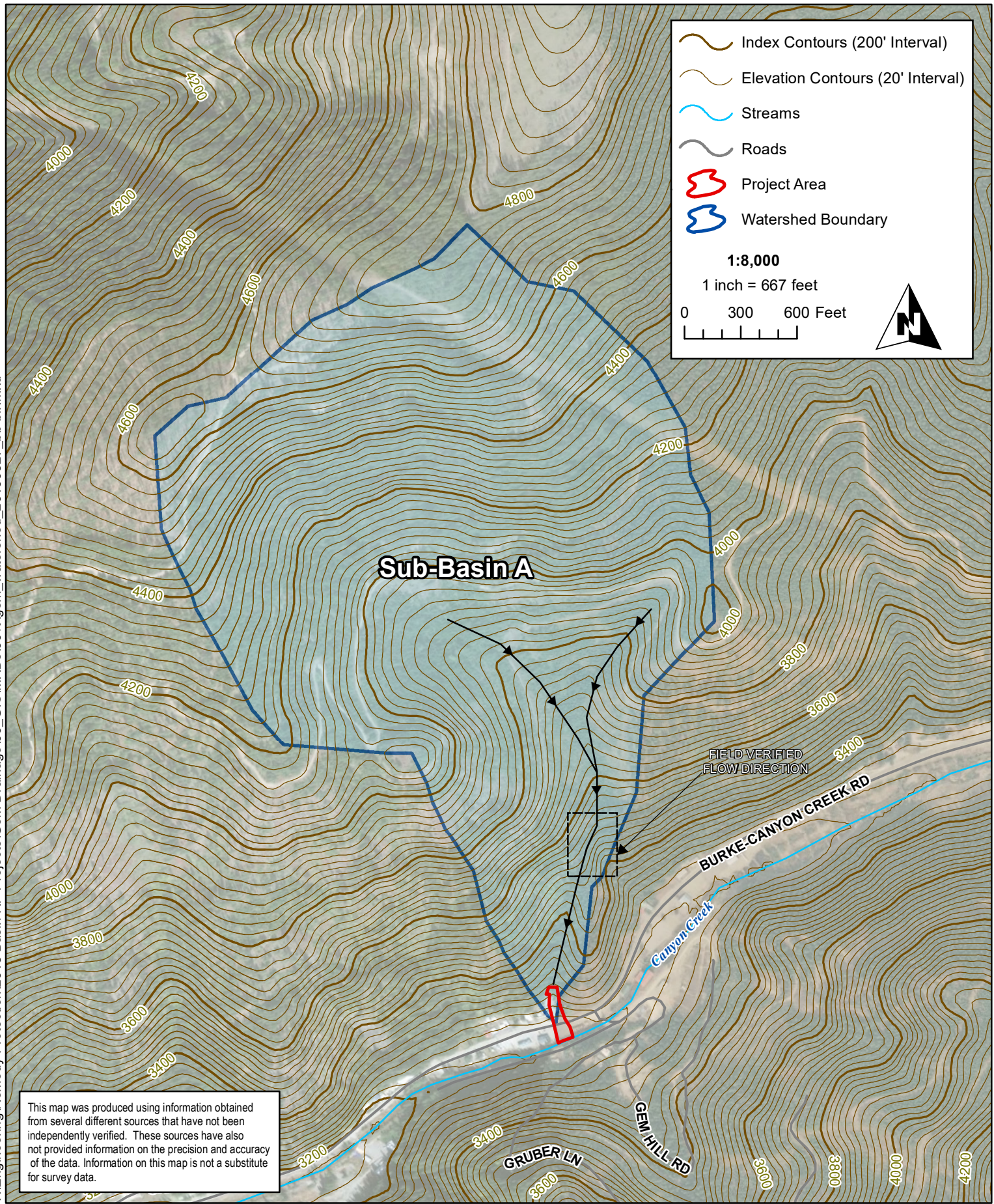
Natural Resources Conservation Service (NRCS), 1986. Urban Hydrology for Small Watersheds T-55 Manual. United States Department of Agriculture: Conservation Engineering Division. June.

U.S. Army Corps of Engineers (USACE), 1998. Engineering and Design Runoff from Snowmelt. Engineer Manual 1110-2-1406. Washington, DC. March 31.

Attachment A
Watershed Map

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	PRINT DATE Mar 28, 2019	REQUESTOR R. Satichtchev	PROJECT NAME Gem Remedy Protection Project	Watershed Boundary
	PROJECT NUMBER 18014-07-02	PROJECT MANAGER D. Pfeifer CARTOGRAPHER B. Bailey/B. Rollins		

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Attachment B
Time of Concentration

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Time of Concentration

Input Required

Automatic Calculation

Notes:

1. Areas, longest flow paths, elevations and slopes were determined in AutoCAD Civil3D 2012.
2. Sheet, shallow, and channel flow determined using the TR-55 and NEH methods with equations listed below; The minimum Tc value used in TR-55 is 0.1 hour.
3. Manning's n for sheet flow from Table 3-1 TR 55 Manual
4. Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets (TR-55, pgs 3-3;3-4).
5. Manning's equation for open channel flow. Average open channel dimensions estimated from field investigation.
6. Manning's n for open channel flow determined by engineering judgement and ITD's Design Manual Hydraulics Appendix B Table B-5.

Overall Characteristics							
SUBBASIN	AREA (ac)	Area (mi ²)	Longest Flow Path	Upper Elevation	Lower Elevation	Elevation Difference	Average Slope of Longest Flow path (ft/ft)
A	162.0	0.25313	4862	4790	3286	1504	0.31

Total Drainage Area (ft²):

7056720.0

Total Drainage Area (acres):

162.0

Sheet Flow						
SUBBASIN	Flow Length (ft)	Lower Elevation (ft)	ΔH (ft)	Slope (ft/ft)	Manning's n for Sheet Flow	t _{c sheet} (min)
A	150	4785	5	0.03	0.800	49.7

$$T_c = 0.007 * (n * L)^{0.8} / (P_2^{0.5} S^{0.4})$$

P_{2yr-24hr} (in)=

2.3

Shallow Flow							
SUBBASIN	Flow	Lower Elevation	ΔH	Slope	Simplified	V	t _{c shallow}
A	3300	3640	1145	0.35	Woodlands	3.0	18.6

*NEH-simplified Manning's Velocity (V) equation Table 15.3

*t_c = Flow Length/V

Channel Flow							
SUBBASIN	Flow	Lower Elevation	ΔH	Slope	Bottom	Depth (ft)	Side Slope [z H: 1V]
A	1412	3286	354	0.25	2.0	0.7	1.0

Channel Flow Cont.							
SUBBASIN	Top	Area	Perimeter	Manning's N	R	V	t _{c channel}
A	3.48	2.03	4.09	0.050	0.50	9.3	2.5

*Manning's Equation

$$V = [1.49 * R^{2/3} S^{0.5}] / n$$

*T_c = V/Flow Length

Totals			
SUBBASIN	Cumulative T _c (min)	Hydrograph Peak Lag (min)	Cumulative T _c (hr)
A	70.8	42.5	1.18

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Attachment C
Soil Type Data

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NRCS Web Soil Survey Information

Input Required

Automatic Calculation

Notes:

1. Hydrologic Soil Group (HSG)

Subbasin	Soil Type	HSG
A	Ashy silt loam/gravelly silt loam	B

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
50	Jacot ashy silt loam, 35 to 65 percent slopes	0.2	0.1%
51	Jacot-Blackprince complex, 35 to 65 percent slopes	161.1	99.7%
90	Udarents-Aquic Udifluvents-Slickens complex, 0 to 4 percent slopes	0.3	0.2%
Totals for Area of Interest		161.6	100.0%

Group A: Soils with low runoff potential due to high infiltration rates, even when thoroughly wetted. These soils consist primarily of deep, well to excessively drained sands and gravels with high water transmission rates (**0.30 in./hr.**). Group **A** soils include **sand, loamy sand, or sandy loam**.

Group B: Soils with moderately low runoff potential due to moderate infiltration rates when thoroughly wetted. These soils consist primarily of moderately deep to deep, and moderately well to well-drained soils. Group **B** soils have moderate water transmission rates (**0.15-0.30 in./hr.**) and include **silt loam or loam**.

Group C: Soils with moderately high runoff potential due to slow infiltration rates when thoroughly wetted. These soils typically have a layer near the surface that impedes the downward movement of water or soils. Group **C** soils have low water transmission rates (**0.05-0.15 in./hr.**) and include **sandy clay loam**.

Group D: Soils with high runoff potential due to very slow infiltration rates. These soils consist primarily of clays with high swelling potential, soils with permanently high water tables, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious parent material. Group **D** soils have very low water transmission rates (**0-0.05 in./hr.**) and include **clay loam, silty clay loam, sandy clay, silty clay, or clay**.



Attachment D
SCS Curve Numbers

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SCS Curve Numbers

Input Required
Automatic Calculation

Notes:

1. CN selected from aerial imagery, engineering judgement and TR-55 Tables 2-2a; 2-2c
2. Reference: USDA SCS Technical Release 55, Urban Hydrology for Small Watersheds, 2nd Edition, June 1986
3. Identified soil type based on USDA-NRCS Web Soil Survey.
4. Ground cover and condition assigned using aerial imagery, field observations, and engineering judgement.
5. Percent Hydrologic Soil Group determined by Web Soil Survey and engineering judgement.

Assumed Percent of Subbasin per Hydrologic Soil Group						
Subbasin(s)	Area (SF)	Soil Type	A	B	C	D
A	7,056,720	Ashy silt loam/gravelly silt loam	-	100%	-	-

Curve Numbers for Hydrologic Soil Group					
Land Cover Types	Condition	A	B	C	D
Woods	Good	30	55	70	77
Woods	Fair	36	60	73	79
Brush	Good	30	48	65	73
Res. 1/8 acre	-	77	85	90	92
Dirt	-	72	82	87	89

Weighted CN and % Impervious for Drainage Area				
Subbasin(s)	Land Cover	Condition	Land Cover %	Weighted CN
A	Woods	Good	79%	55
	Woods	Fair	3%	
	Brush	Good	16%	
	Res. 1/8 acre	-	0%	
	Dirt	-	2%	

Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area ^{2/}	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas (pervious areas only, no vegetation) ^{5/}		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

^{1/} Average runoff condition, and I_a = 0.2S.

^{2/} The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: Impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

^{3/} CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

^{4/} Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

^{5/} Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2c Runoff curve numbers for other agricultural lands ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. ^{2/}	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. ^{3/}	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 ^{4/}	48	65	73
Woods—grass combination (orchard or tree farm). ^{5/}	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. ^{6/}	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 ^{4/}	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

^{1/} Average runoff condition, and $I_a = 0.2S$.

^{2/} *Poor*: <50% ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: > 75% ground cover and lightly or only occasionally grazed.

^{3/} *Poor*: <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

^{4/} Actual curve number is less than 30; use CN = 30 for runoff computations.

^{5/} CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

^{6/} *Poor*: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

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Attachment E
Precipitation

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Precipitation Events

Notes:

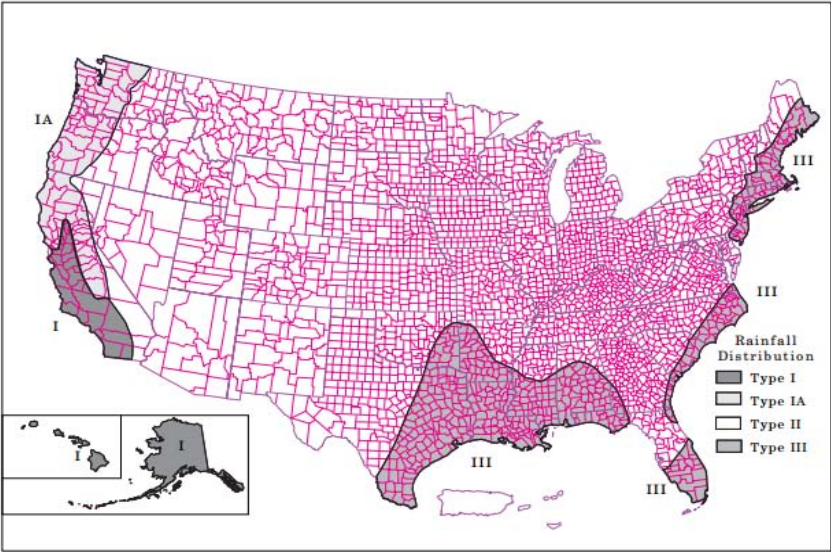
- 1. See "Snowmelt Runoff" calculation for assumptions on snowmelt contribution.
- 2. Precipitation values obtained from NOAA Atlas 2 website (<http://www.nws.noaa.gov/oh/hdsc/noaaatlas2.htm>). The website outputs the 2-year and 100-year (24-hour) precipitation depths based on an input latitude and longitude. To interpolate the 50-year, 24-hour precipitation depth from the provided values, utilized Figure 6 from the NOAA Atlas 2 document. See calculations/procedure on the next sheet.
- 3. Figure B-2 pulled from: USDA SCS Technical Release 55, Urban Hydrology for Small Watersheds, 2nd Edition, June 1986

Input Required
Automatic Calculation

Event Frequency	Precipitation Depth (in)
2yr	2.3
50yr	4.00

Rainfall Distribution = SCS Type 2

Figure B-2 Approximate geographic boundaries for NRCS (SCS) rainfall distributions



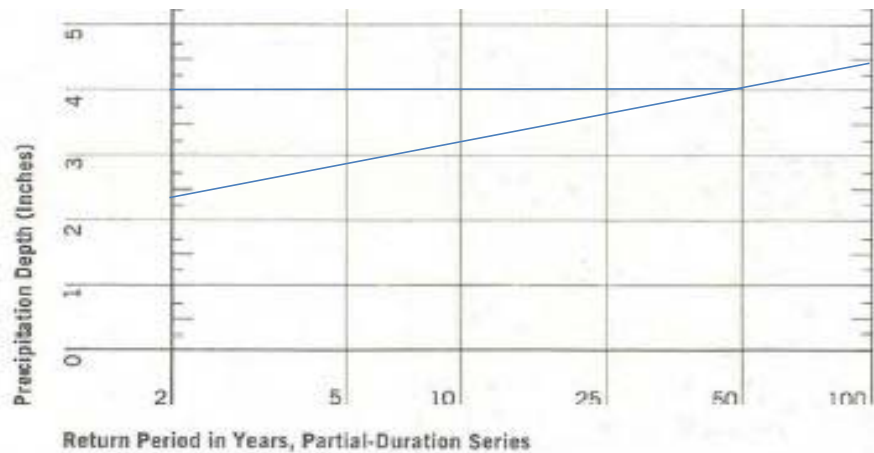
Precipitation Frequency Data Output

NOAA Atlas 2 (<http://www.nws.noaa.gov/oh/hdsc/noaaatlas2.htm>)

Latitude	47.511566
Longitude	-115.867367
Approx Location	Point taken at the middle of the Gem Drainage watershed.
Map	Precipitation (inches)
2-year 24-hour	2.3
100-year 24-hour	4.48

Estimated 2-year Precipitation Depth (in) =	2.3
Estimated 50-year Precipitation Depth (in) =	4

Use Figure 6 from NOAA Atlas 2 to interpolate 50-year, 24-hour precipitation depth



Attachment F
Snowmelt

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Snowmelt Runoff

Notes:

1. Snowmelt calculated using the energy budget equation below in order to add to precipitation value.
2. Snowmelt calculation procedure followed: Engineering and Design Runoff from Snowmelt, Engineering Manual 1110-2-1406 (USACE, 1998)
3. Air Temp was derived by averaging the mean temperature in March, April, and May, from 1907 through 1967 at the COOP Station Burke 2 ENE (109498). Source: www.wrcc.dri.edu/coopmap/
4. Wind Velocity was found online at <http://www.usa.com/wallace-id-weather.htm>, and was averaged from 1980-2010.
5. Basin Constant ranges from 0.3 (dense cover) to 1.0 (no cover) based on thickness of the forest in the watershed. Determined by aerial images and engineering judgment.
6. Selection of Open vs. Dense Forest Equation applicability was based on examination of aerial imagery.
7. Snowmelt runoff assumed for area of sub-basins greater than 3,200 feet in elevation, which was all basins.

Basin Characteristics	
Atmospheric Assumptions	
Air Temp	38
wind velocity	21
basin constant	0.65
P50 (in/day)	4.00

Additional Snow Melt (in/day)		
	Open Forest	Dense Forest
M50	1.12	0.66

Subbasin	Area (SF)	M50 Additional Base Flow (cfs)		Selected M50 Base Flow (cfs)
		Open Forest	Dense Forest	
A	7,056,720	7.62	4.51	4.51

For open or partly forested basin areas,

$$M = (0.029 + 0.0084kv + 0.007P_r)(T_a - 32) + 0.09$$

For heavily forested areas,

$$M = (0.074 + 0.007P_r)(T_a - 32) + 0.05 \quad (5)$$

M = snowmelt, in./day

k = basin wind coefficient

v = wind velocity, miles/hr

P_r = rate of precipitation, in./day

T_a = temperature of saturated air, at the 3-m (10-ft) level, °F

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Attachment G
StreamStats Analysis Report

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USGS StreamStats

StreamStats Peak Flow Estimation	
Peak-Flow Streamflow	
Statistic	Flow (ft ³ /s)
PK2	4.77
PK10	11.2
PK25	15.2
PK50	18.4
PK100	22.5



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Attachment H
SCS TR-55 Analysis

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SCS TR-55 Graphical Peak Discharge Method

Notes:

1. Table 4-II from USDA Soil Conservation Service TR-55, Urban Hydrology for Small Watersheds, 2nd Edition, June 1986

Precipitation Data Inputs	
Rainfall Distribution =	SCS Type 2
Pond adjustment Factor =	1
Rainfall Event	Total Rainfall (in)
P _{50-24 hr}	4

Input	Output
Figure Input Value	Design Value

								Peak Rainfall Runoff		
								*Input From Exhibit 4-II Graph		
Subbasin	Area (ac)	Area (mi ²)	Tc (hr)	Hydrologic Soil Group	Weighted CN	Initial Abstraction 0.2S	Ia/P ₅₀	P ₅₀ Unit peak discharge-q _u (csm/in)	Direct Runoff Q ₅₀ (in)	Qp ₅₀
A	162.0	0.25313	1.18	B	55	1.64	0.41	210	0.53	28.2

Volume of Runoff, Q:

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S} \quad S = \left(\frac{1000}{CN} - 10 \right)$$

where:

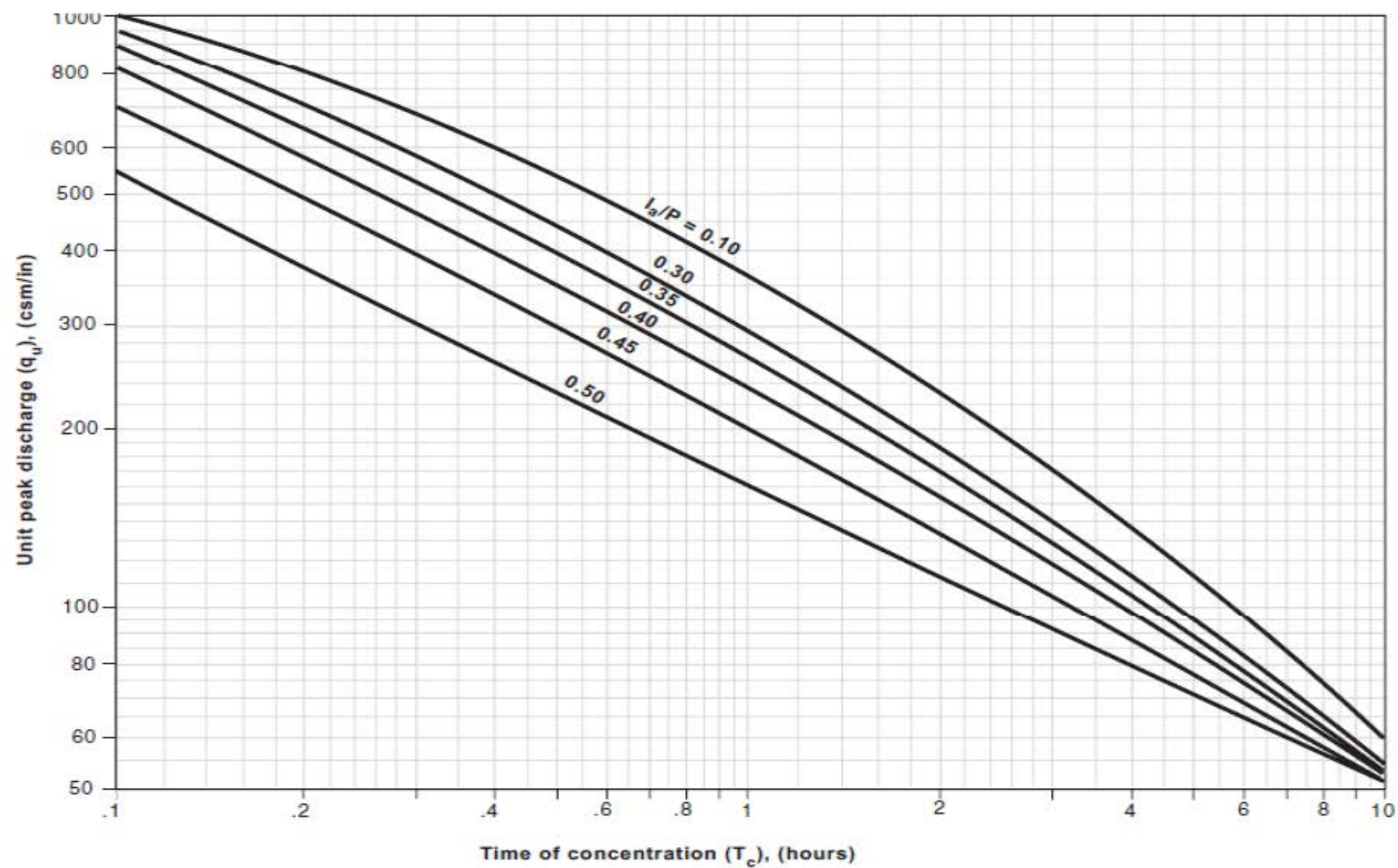
Q=volume of runoff, inches

P=volume of rainfall, inches

S=potential maximum retention, inches

CN=runoff curve number

Exhibit 4-II Unit peak discharge (q_u) for NRCS (SCS) type II rainfall distribution



Attachment I
Existing Pipe Network SSA Hydraulic Analysis

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Project Description

File Name Gem_EX_System.SPF

Project Options

Flow Units CFS
Elevation Type Elevation
Hydrology Method SCS TR-55
Time of Concentration (TOC) Method User-Defined
Link Routing Method Hydrodynamic
Enable Overflow Ponding at Nodes YES
Skip Steady State Analysis Time Periods ... NO

Analysis Options

Start Analysis On Nov 14, 2018 00:00:00
End Analysis On Nov 15, 2018 00:00:00
Start Reporting On Nov 14, 2018 00:00:00
Antecedent Dry Days 0 days
Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
Reporting Time Step 0 00:05:00 days hh:mm:ss
Routing Time Step 30 seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	1
Nodes.....	6
<i>Junctions</i>	5
<i>Outfalls</i>	1
<i>Flow Diversions</i>	0
<i>Inlets</i>	0
<i>Storage Nodes</i>	0
Links.....	5
<i>Channels</i>	1
<i>Pipes</i>	4
<i>Pumps</i>	0
<i>Orifices</i>	0
<i>Weirs</i>	0
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage	Data	Data Source	Rainfall	Rain	State	County	Return	Rainfall	Rainfall
	ID	Source	ID	Type	Units			Period	Depth	Distribution
								(years)	(inches)	
1		Time Series	TS-01	Cumulative	inches	Idaho	Shoshone	50	4.00	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	Sub-A	162.00	55.00	4.00	0.53	85.86	26.73	0 01:10:48

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	Intake	Junction	3260.77	3263.21	3260.77	3263.21	0.00	31.16	3263.21	0.00	0.00	0 12:55	0.62	25.00
2	Null Structure	Junction	3230.74	3232.70	3230.74	3232.70	0.00	22.20	3232.25	0.00	2.48	0 00:00	0.00	0.00
3	Out-1Pipe - (48)	Junction	3242.72	3244.22	3242.72	3244.22	0.00	22.20	3243.36	0.00	3.35	0 00:00	0.00	0.00
4	Structure - (47)	Junction	3248.17	3250.94	3248.17	3250.94	0.00	29.00	3250.94	0.00	0.00	0 12:41	4.81	61.00
5	Structure - (48)	Junction	3226.63	3228.90	3226.63	3228.90	0.00	22.20	3227.87	0.00	1.03	0 00:00	0.00	0.00
6	Out-1Pipe - (50)	Outfall	3218.57					22.20	3219.69					

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Reported	Surcharged Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	Link-01	Pipe	Intake	Structure - (47)	31.23	3260.77	3249.17	37.1300	18.000	0.0240	29.00	34.67	0.84	18.11	1.50	1.00	29.00	SURCHARGED
2	Pipe - (48)	Pipe	Structure - (47)	Out-1Pipe - (48)	68.40	3248.17	3242.72	7.9800	18.000	0.0120	22.20	32.14	0.69	16.39	1.07	0.72	0.00	Calculated
3	Pipe - (49)	Pipe	Null Structure	Structure - (48)	68.33	3230.74	3226.63	6.0000	24.000	0.0240	22.20	30.02	0.74	9.62	1.38	0.69	0.00	Calculated
4	Pipe - (50)	Pipe	Structure - (48)	Out-1Pipe - (50)	88.60	3226.63	3218.57	9.1000	24.000	0.0240	22.20	36.96	0.60	11.53	1.18	0.59	0.00	Calculated
5	Link-02	Channel	Out-1Pipe - (48)	Null Structure	66.40	3242.72	3230.74	18.0400	48.000	0.0350	22.20	1149.37	0.02	7.08	1.08	0.27	0.00	

Subbasin Hydrology

Subbasin : Sub-A

Input Data

Area (ac) 162.00
Weighted Curve Number 55.00
Rain Gage ID Rain Gage-01

Composite Curve Number

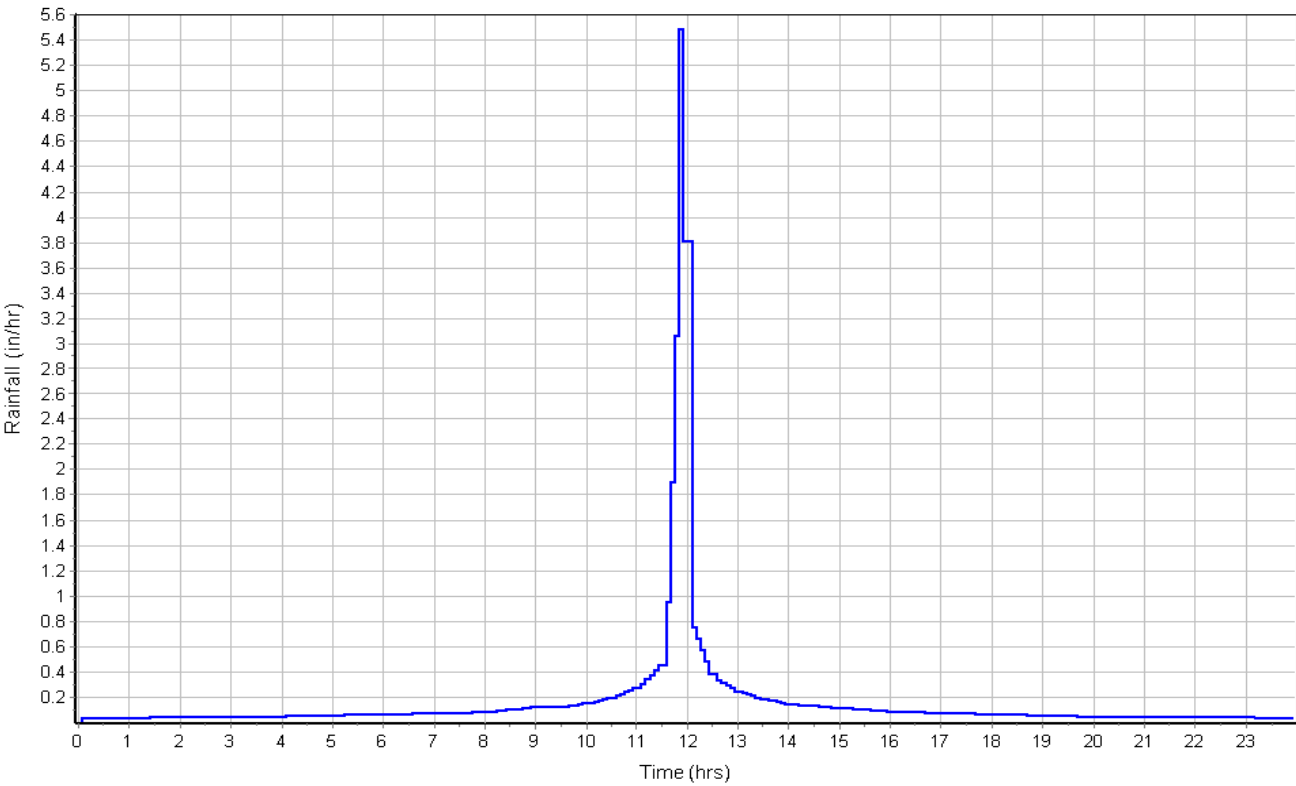
Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	161.10	B	55.00
Composite Area & Weighted CN	161.10		55.00

Subbasin Runoff Results

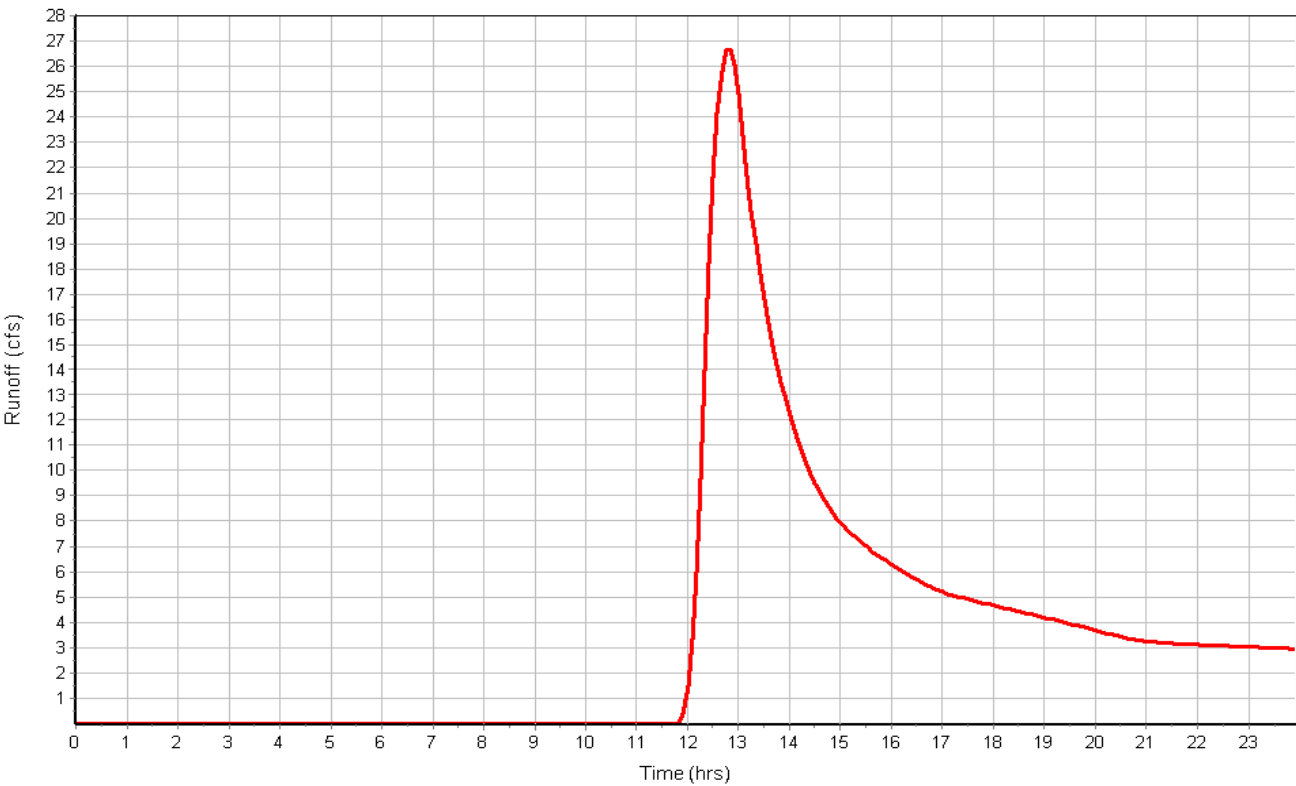
Total Rainfall (in) 4.00
Total Runoff (in) 0.53
Peak Runoff (cfs) 26.73
Weighted Curve Number 55.00
Time of Concentration (days hh:mm:ss) 0 01:10:48

Subbasin : Sub-A

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN Element ID	Invert Elevation	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1 Intake	3260.77	3263.21	2.44	3260.77	0.00	3263.21	0.00	0.00	0.00
2 Null Structure	3230.74	3232.70	1.96	3230.74	0.00	3232.70	0.00	0.00	0.00
3 Out-1Pipe - (48)	3242.72	3244.22	1.50	3242.72	0.00	3244.22	0.00	0.00	0.00
4 Structure - (47)	3248.17	3250.94	2.77	3248.17	0.00	3250.94	0.00	0.00	0.00
5 Structure - (48)	3226.63	3228.90	2.27	3226.63	0.00	3228.90	0.00	0.00	0.00

Junction Results

SN Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surge Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1 Intake	31.16	31.16	3263.21	2.44	0.00	0.00	3261.33	0.56	0 12:41	0 12:55	0.62	25.00
2 Null Structure	22.20	0.00	3232.25	1.51	0.00	2.48	3231.50	0.76	0 13:06	0 00:00	0.00	0.00
3 Out-1Pipe - (48)	22.20	0.00	3243.36	0.64	0.00	3.35	3243.08	0.36	0 12:47	0 00:00	0.00	0.00
4 Structure - (47)	29.00	0.00	3250.94	2.77	0.00	0.00	3248.90	0.73	0 12:29	0 12:41	4.81	61.00
5 Structure - (48)	22.20	0.00	3227.87	1.24	0.00	1.03	3227.29	0.66	0 12:35	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop	Average Slope	Shape	Height	Width	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow	Flap Gate
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)		(ft)	(ft)					(cfs)	
1	Link-02	66.40	3242.72	0.00	3230.74	0.00	11.98	18.0400	Trapezoidal	4.000	18.000	0.0350	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	Link-02	22.20	0 12:31	1149.37	0.02	7.08	0.16	1.08	0.27	0.00		

Pipe Input

SN	Element ID	Length	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow	Flap Gate	No. of Barrels
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)		(in)	(in)				(cfs)			
1	Link-01	31.23	3260.77	0.00	3249.17	1.00	11.60	37.1300	CIRCULAR	18.000	18.000	0.0240	0.5000	0.5000	0.0000	0.00	No	1
2	Pipe - (48)	68.40	3248.17	0.00	3242.72	0.00	5.46	7.9800	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
3	Pipe - (49)	68.33	3230.74	0.00	3226.63	0.00	4.10	6.0000	CIRCULAR	24.000	24.000	0.0240	0.5000	0.6000	0.0000	0.00	No	1
4	Pipe - (50)	88.60	3226.63	0.00	3218.57	0.00	8.06	9.1000	CIRCULAR	24.000	24.000	0.0240	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 Link-01	29.00	0 12:41	34.67	0.84	18.11	0.03	1.50	1.00	29.00		SURCHARGED
2 Pipe - (48)	22.20	0 12:41	32.14	0.69	16.39	0.07	1.07	0.72	0.00		Calculated
3 Pipe - (49)	22.20	0 12:35	30.02	0.74	9.62	0.12	1.38	0.69	0.00		Calculated
4 Pipe - (50)	22.20	0 12:35	36.96	0.60	11.53	0.13	1.18	0.59	0.00		Calculated

Attachment J
Design Intake Hydraulic Analysis in HY-8

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HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 31.24 cfs

Maximum Flow: 31.24 cfs

Table 1 - Summary of Culvert Flows at Crossing: Crossing 1

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
12.96	0.00	0.00	0.00	1
13.26	3.12	3.12	0.00	1
13.44	6.25	6.25	0.00	1
13.58	9.37	9.37	0.00	1
13.71	12.50	12.50	0.00	1
13.84	15.62	15.62	0.00	1
13.95	18.74	18.74	0.00	1
14.06	21.87	21.87	0.00	1
14.16	24.99	24.99	0.00	1
14.26	28.12	28.12	0.00	1
14.35	31.24	31.24	0.00	1
16.30	65.33	65.33	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing 1

Total Rating Curve

Crossing: Crossing 1

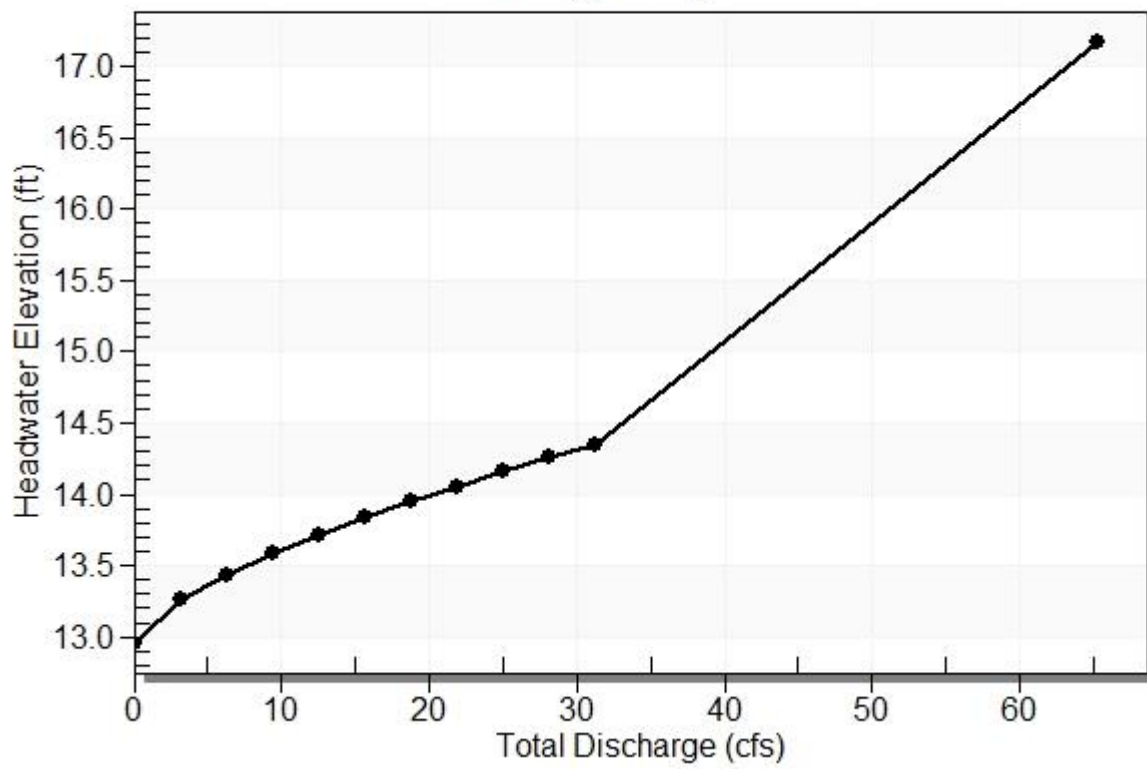


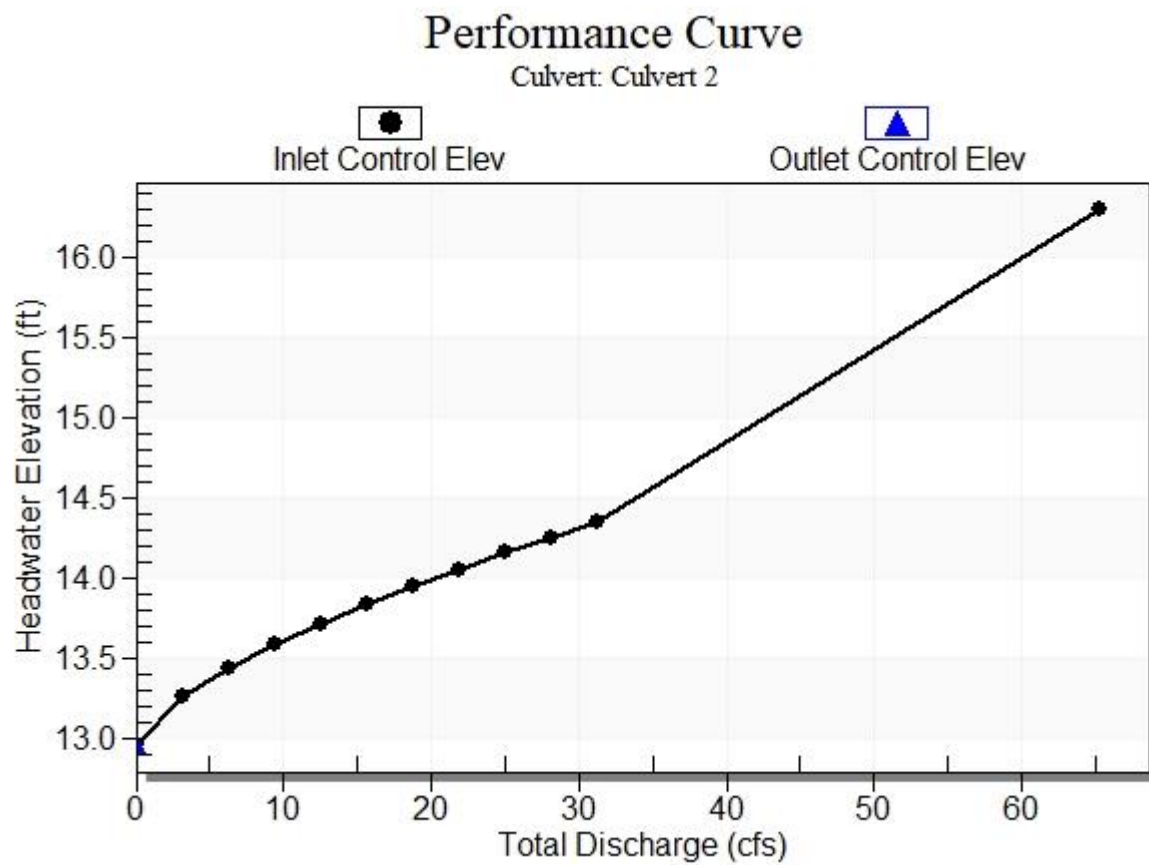
Table 2 - Culvert Summary Table: Culvert 2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	12.96	0.000	0.000	0-NF	0.000	0.000	1.000	1.000	0.000	0.000
3.12	3.12	13.26	0.299	0.0*	1-S2n	0.208	0.614	3.430	1.000	0.994	0.000
6.25	6.25	13.44	0.475	0.0*	1-S2n	0.290	0.884	3.552	1.000	1.989	0.000
9.37	9.37	13.58	0.622	0.0*	1-S2n	0.354	1.091	3.622	1.000	2.983	0.000
12.50	12.50	13.71	0.754	0.0*	1-S2n	0.409	1.269	3.693	1.000	3.978	0.000
15.62	15.62	13.84	0.875	0.0*	1-S2n	0.457	1.420	3.765	1.000	4.972	0.000
18.74	18.74	13.95	0.988	0.0*	1-S2n	0.500	1.556	3.826	1.000	5.966	0.000
21.87	21.87	14.06	1.095	0.0*	1-S2n	0.541	1.670	3.887	1.000	6.961	0.000
24.99	24.99	14.16	1.197	0.0*	1-S2n	0.580	1.761	3.946	1.000	7.955	0.000
28.12	28.12	14.26	1.294	0.0*	1-S2n	0.616	1.831	4.001	1.000	8.950	0.000
31.24	31.24	14.35	1.389	0.0*	1-S2n	0.651	1.878	4.055	1.000	9.944	0.000

* Full Flow Headwater elevation is below inlet invert.

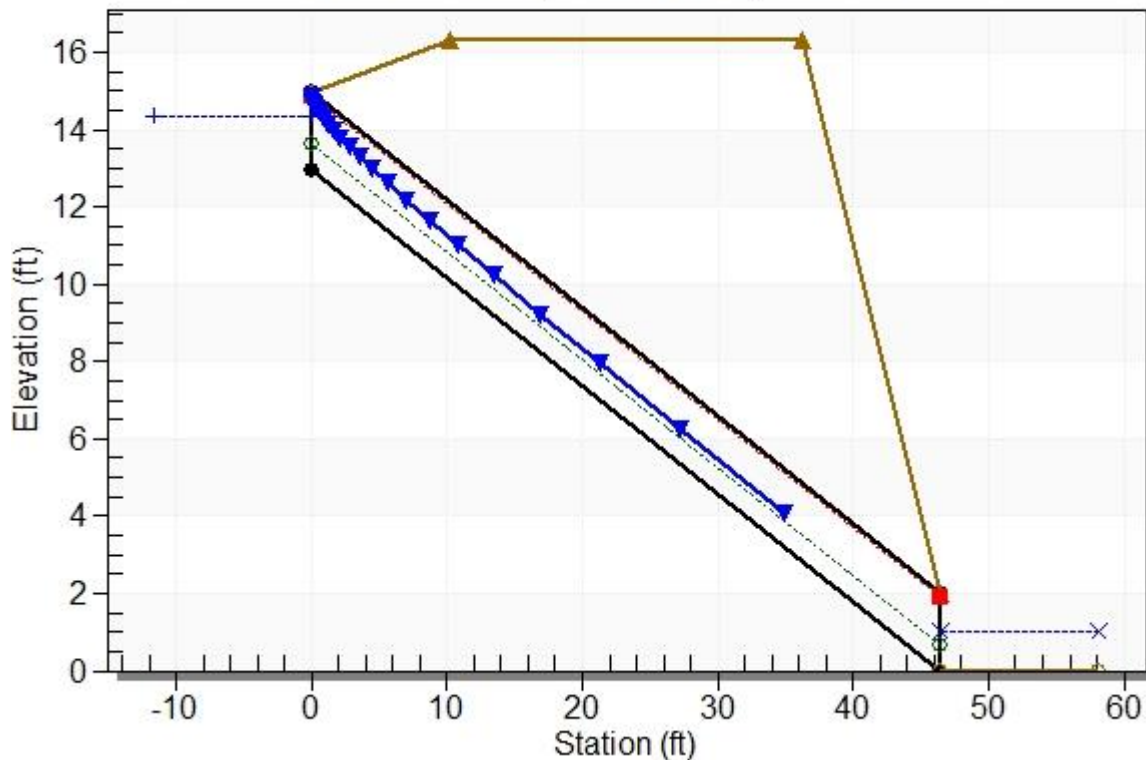
Straight Culvert
Inlet Elevation (invert): 12.96 ft, Outlet Elevation (invert): 0.00 ft
Culvert Length: 36.27 ft, Culvert Slope: 0.2787
Inlet Throat Elevation: 9.62 ft, Inlet Crest Elevation: 0.00 ft

Culvert Performance Curve Plot: Culvert 2



Water Surface Profile Plot for Culvert: Culvert 2

Crossing - Crossing 1, Design Discharge - 31.2 cfs
Culvert - Culvert 2, Culvert Discharge - 31.2 cfs



Site Data - Culvert 2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 12.96 ft

Outlet Station: 46.50 ft

Outlet Elevation: 0.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 2

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Side-Tapered, Rectangular

Inlet Configuration: Square Edge Top (26-90°) Wingwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Crossing 1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	1.00	1.00
3.12	1.00	1.00
6.25	1.00	1.00
9.37	1.00	1.00
12.50	1.00	1.00
15.62	1.00	1.00
18.74	1.00	1.00
21.87	1.00	1.00
24.99	1.00	1.00
28.12	1.00	1.00
31.24	1.00	1.00

Tailwater Channel Data - Crossing 1

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1.00 ft

Roadway Data for Crossing: Crossing 1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 14.00 ft

Crest Elevation: 16.30 ft

Roadway Surface: Gravel

Roadway Top Width: 26.00 ft

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Attachment K
Design Pipe Network Hydraulic Analysis in SSA

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Project Description

File Name Gem_Design_System_190516.SPF

Project Options

Flow Units CFS
Elevation Type Elevation
Hydrology Method SCS TR-55
Time of Concentration (TOC) Method User-Defined
Link Routing Method Hydrodynamic
Enable Overflow Ponding at Nodes YES
Skip Steady State Analysis Time Periods NO

Analysis Options

Start Analysis On Nov 14, 2018 00:00:00
End Analysis On Nov 15, 2018 00:00:00
Start Reporting On Nov 14, 2018 00:00:00
Antecedent Dry Days 0 days
Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
Reporting Time Step 0 00:05:00 days hh:mm:ss
Routing Time Step 30 seconds

Number of Elements

Qty
Rain Gages 1
Subbasins..... 1
Nodes..... 4
 Junctions 3
 Outfalls 1
 Flow Diversions 0
 Inlets 0
 Storage Nodes 0
Links..... 3
 Channels 0
 Pipes 3
 Pumps 0
 Orifices 0
 Weirs 0
 Outlets 0
Pollutants 0
Land Uses 0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	Rain Gage-01	Time Series	TS-01	Cumulative	inches	Idaho	Shoshone	50	4.00	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	Sub-A	162.00	55.00	4.00	0.53	85.86	26.73	0 01:10:48

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	Gem_Intake	Junction	3259.05	3262.39	3259.05	3264.21	25.00	31.16	3259.92	0.00	2.47	0 00:00	0.00	0.00
2	MH-1	Junction	3244.09	3253.31	3244.09	3253.31	0.00	31.16	3247.03	0.00	6.28	0 00:00	0.00	0.00
3	MH-2	Junction	3226.19	3233.79	3226.19	3233.79	0.00	31.16	3232.93	0.00	0.87	0 00:00	0.00	0.00
4	Out-1Pipe - (55)	Outfall	3228.00					31.16	3229.87					

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Reported	Surcharged Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	Link-02	Pipe	MH-1	MH-2	122.74	3246.09	3228.19	14.5800	24.000	0.0150	31.16	74.87	0.42	14.91	1.47	0.74	0.00	Calculated
2	Pipe - (51)	Pipe	Gem_Intake	MH-1	44.69	3259.05	3246.09	29.0000	24.000	0.0120	31.16	131.98	0.24	22.65	0.91	0.45	0.00	Calculated
3	Pipe - (55)	Pipe	MH-2	Out-1Pipe - (55)	94.49	3228.19	3228.00	0.2000	24.000	0.0120	31.16	10.96	2.84	10.02	1.94	0.97	0.00	> CAPACITY

Subbasin Hydrology

Subbasin : Sub-A

Input Data

Area (ac) 162.00
Weighted Curve Number 55.00
Rain Gage ID Rain Gage-01

Composite Curve Number

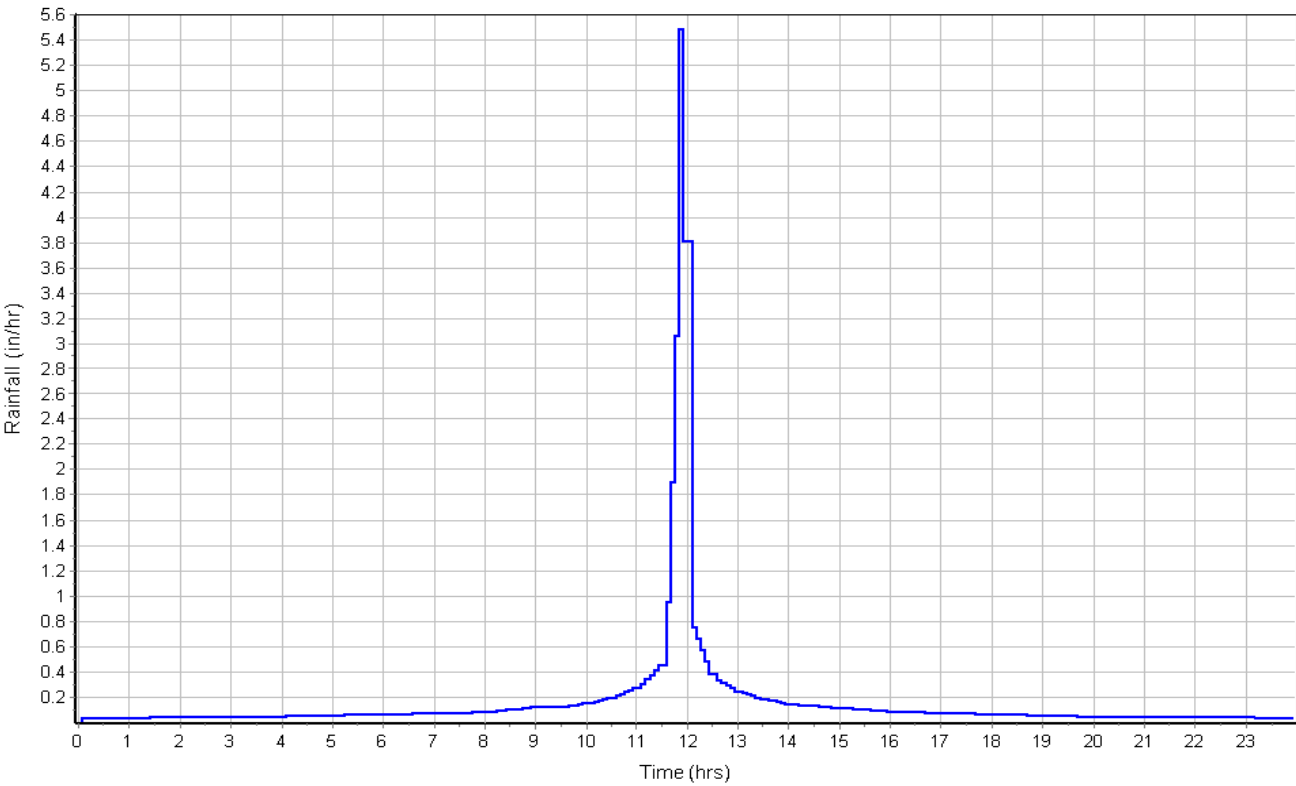
Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	162.00	B	55.00
Composite Area & Weighted CN	162.00		55.00

Subbasin Runoff Results

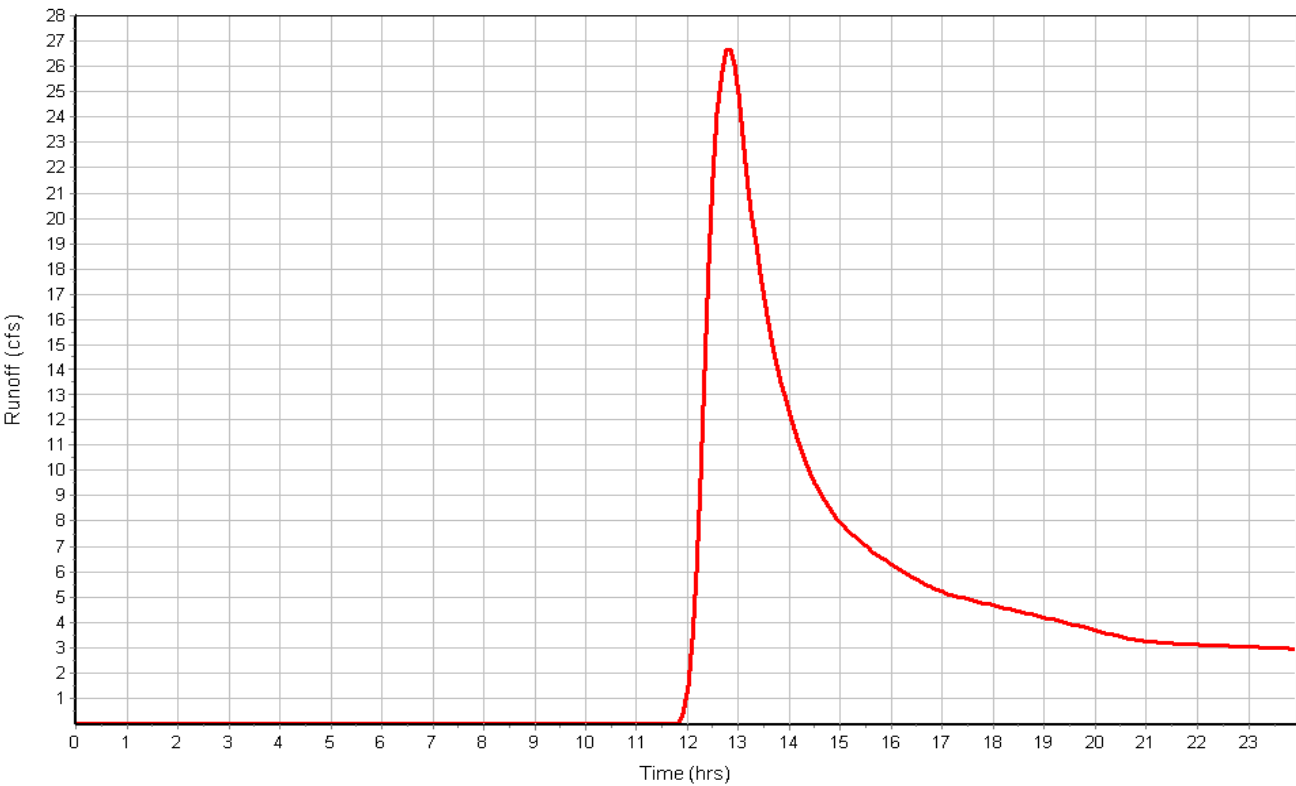
Total Rainfall (in) 4.00
Total Runoff (in) 0.53
Peak Runoff (cfs) 26.73
Weighted Curve Number 55.00
Time of Concentration (days hh:mm:ss) 0 01:10:48

Subbasin : Sub-A

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	Gem_Intake	3259.05	3262.39	3.34	3259.05	0.00	3264.21	1.82	25.00	0.00
2	MH-1	3244.09	3253.31	9.22	3244.09	0.00	3253.31	0.00	0.00	0.00
3	MH-2	3226.19	3233.79	7.60	3226.19	0.00	3233.79	0.00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surge Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
		(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1	Gem_Intake	31.16	31.16	3259.92	0.87	0.00	2.47	3259.49	0.44	0 12:55	0 00:00	0.00	0.00
2	MH-1	31.16	0.00	3247.03	2.94	0.00	6.28	3246.59	2.50	0 12:55	0 00:00	0.00	0.00
3	MH-2	31.16	0.00	3232.93	6.74	0.00	0.87	3229.93	3.74	0 12:55	0 00:00	0.00	0.00

Pipe Input

SN	Element ID	Length	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow	Flap Gate	No. of Barrels
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)		(in)	(in)					(cfs)		
1	Link-02	122.74	3246.09	2.00	3228.19	2.00	17.90	14.5800	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
2	Pipe - (51)	44.69	3259.05	0.00	3246.09	2.00	12.96	29.0000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
3	Pipe - (55)	94.49	3228.19	2.00	3228.00	0.00	0.19	0.2000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	Link-02	31.16	0 12:55	74.87	0.42	14.91	0.14	1.47	0.74	0.00		Calculated
2	Pipe - (51)	31.16	0 12:55	131.98	0.24	22.65	0.03	0.91	0.45	0.00		Calculated
3	Pipe - (55)	31.16	0 12:55	10.96	2.84	10.02	0.16	1.94	0.97	0.00		> CAPACITY

Appendix F

Technical Specifications

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TECHNICAL SPECIFICATIONS

GEM DRAINAGE REMEDY PROTECTION PROJECT Shoshone County, Idaho

Owner:

Coeur d'Alene **T**rust

Coeur d'Alene Trust

1176 Big Creek Road

Kellogg, ID 83837

Phone: (208) 783-0222

Engineer:



Alta Science & Engineering, Inc.

1220 Big Creek Road, Suite A

Kellogg, ID 83837

Phone: (208) 786-1206

April 3, 2019

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Section 1004 – Runoff Diversion

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Section 2020 – Survey Monuments

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Section 2040 – Fencing

Section 2050 – Construction Geotextiles

COEUR D'ALENE TRUST BASE SPECIFICATIONS

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SECTION 01140

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SCOPE OF WORK

This section describes general requirements of the project, such as coordination, site access, and weekly meetings.

1.2 COORDINATION AND ACCESS TO SITE

The Trust Representative shall provide agency coordination to assist the Contractor in completing the work with a minimum of interference and inconvenience. Access to businesses and residences shall be available during construction. If access must be impacted, the contractor shall notify the property owner 48 hours in advance. The closure, or impact, shall be for no more than 8 hours, unless otherwise coordinated and approved by the Trust Representative. Pedestrian access shall be available at all times. Construction and staging in the public right of way shall be performed in a manner such that access for emergency vehicles is maintained.

1.3 UTILITIES

Utilities identified in the Construction Drawings are in approximate locations unless otherwise specified and may not include or identify all utilities present at the Site. Contractor is responsible for calling One-Call at 811 or 800-398-3285 at least five (5) days prior to starting construction. Contractor shall locate and protect all utilities and repair at Contractor's expense any damage to utilities caused by Contractor.

The Contractor shall notify the Trust's Representative of all buried utilities encountered during the Work and shall leave discovered utilities exposed until the type, size, and location of the utility is recorded and mapped under the requirements of Section 01781 AS BUILT RECORDS AND DRAWINGS.

1.3.1 Utility Outages

Contractor shall coordinate utility outages with utility companies and the Trust Representative at least 7 days in advance of expected disruption of service. Outages shall be kept to a minimum and any one outage shall not last more than 2 hours.

1.3.2 Communications with Utilities

The Contractor shall provide copies of all written communications with the utility owner(s) to the Trust Representative. The Contractor shall notify the appropriate utility owner(s) at least five (5) days in advance of excavating near any utility within the construction area. The Contractor shall meet and coordinate with the appropriate utility representatives to determine exact locations, crossing requirements, and schedules. The Contractor shall provide the Trust Representative at least 48 hours advance notice of meetings scheduled with utility owner(s).

1.4 PERSONNEL IDENTIFICATION

1.4.1 Employee Listing

The Contractor shall submit a complete listing of Contractor personnel, including job title and identification credential number, who will be working on the project. This listing shall be updated as needed to ensure that the Trust has been notified of any changes of Contractor Personnel in advance of new personnel engaging in work on the project.

1.4.2 Identification Credentials

Contractor personnel shall either be issued a photo identification card (ID) by the Contractor or agree to provide their individual vehicle driver's license as appropriate identification credential. In either case, the identification number shall be included on the listing required above. If the Contractor determines to issue ID cards to its employees, the following information shall be included:

Contractor Identification and Card Number Indicating Employees:

- | | |
|---------------------|--------------|
| o Full Name | o Height |
| o Current Address | o Weight |
| o Birth Date | o Hair Color |
| o Recent Photograph | o Eye Color |

1.4.3 Employee Termination

If a Contractor employee resigns or is terminated, the Trust Representative shall be so notified at the earliest opportunity, but in no case later than the start of the succeeding workday.

1.4.4 Access Control

Contractor personnel shall be instructed to present identification credential upon request by proper authority as established by the Trust Representative. Contractor personnel are required to surrender any credentials issued upon completion of employment.

1.5 WEEKLY COORDINATION MEETINGS

The Contractor and Trust shall meet weekly as described in Section 01320 PROGRESS SCHEDULE. A meeting time and place shall be mutually agreed upon. The Contractor shall submit minutes of the meetings within three working days, for review and acceptance by the Trust Representative.

1.6 CONSIDERATION FOR UNUSUALLY SEVERE WEATHER

In the event of unusually severe weather the Trust may grant an extension of contract time under the provisions of article 12. Allowances may be granted under the following conditions:

- a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

- b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.
- c. The Contractor will provide the Trust with a schedule of monthly-anticipated adverse weather delay days based on weather data. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather-dependent activities.
- d. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily Contractor quality control (CQC) report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delays must prevent work on critical activities for 50 percent or more of the Contractor's scheduled workday.
- e. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days.

Adverse weather days will be determined by the Trust Representative. The Trust Representative will issue any modification of contract time in accordance with Contract Article 12.03 (Delays).

1.7 FIRE RESTRICTIONS

Work will be conducted within or near to the Coeur d'Alene National Forest. During the summer months, this area may be under fire restrictions requiring limitations to certain work practices and the requirement to maintain specific fire tools on-site. Additional information regarding fire restrictions is available at <http://www.idl.idaho.gov/bureau/firemgt.htm>. The Contractor's work shall conform to the appropriate fire restrictions.

1.8 LOCAL LABOR PARTICIPATION

The Trust requires a minimum of 80% local labor and subcontractors. The percent local will be calculated based on average utilization by the hour for Contractor and subcontractor employees. The Contractor shall report the percentage of local labor used in the work with each request for payment and in the final construction report. For project purposes, "local" shall encompass the area east of the Idaho/Washington border and west of Lookout Pass.

1.9 PHOTOGRAPHIC DOCUMENTATION

The Contractor shall photographically document each property within project extents, prior to any disturbance of the property, in order to record existing site conditions under the requirements of Section 01782 CLOSEOUT SUBMITTALS. The existing condition photographic documentation shall be used in comparison with contractor's progress photographs to confirm that properties are restored to original condition, unless otherwise agreed upon in writing, by property owner and contractor, with authorization from the Trust Representative. Any agreements shall be furnished to the Trust for review as soon as practicable.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

-- End of Section --

SECTION 01320

PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment, and incidentals required to prepare and update a project schedule.

1.2 SUBMITTALS

Trust approval is required for submittals with a "T" designation; submittals not having a "T" designation are for information only. Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Progress Schedule; T

Submit the Progress Schedule, defining the Contractor's planned operations for the first 90 calendar days for approval within 10 calendar days after the Notice to Proceed (NTP) is acknowledged. The Progress Schedule must include all of the required Plan and Program preparations, submittals and approvals identified in the contract (for example, Quality Control Plan, Construction Site Plan, and Environmental Protection Plan, etc.) as well as permitting activities, and other non-construction activities intended to occur within the first 90 calendar days.

Project Milestone Dates: Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

Critical Path: Clearly show the critical path.

SD-03 Product Data

Periodic Schedule Updates; T

Submit a Periodic Schedule Update not later than 4 working days after the schedule update meeting, reflecting only those changes made during the previous update meeting.

Schedule Status Reports; T

Submit a Schedule Status Report with the Progress Schedule, and with every Periodic Schedule Update through the life of the project. The narrative report shall include a description of activities along the critical path where, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to communicate to the Trust, the Contractor's thorough analysis of the schedule output

and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. Identify and explain why any activities that, based their calculated late dates, should have either started or finished during the update period but did not. The narrative report shall specifically reference, on an activity by activity basis, all changes made since the previous period.

Requests For Time Extensions; T

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the NTP or construction directive issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Articles and shall include, as a minimum:

- a. A list of affected activities.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.

The Trust Representative may request an interim update with revised activities for any requested time extension of over 2 weeks. Contractor shall provide an update within 4 days of the Trust Representative's request.

1.3 DEFAULT TERMS

Failure of the Contractor to comply with the requirements of the Trust Representative shall be grounds for a determination, by the Trust, that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Trust may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with Article 15 of the Contract.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 PROGRESS SCHEDULE

Prepare for approval a Progress Schedule, as specified herein, pursuant to the Contract Articles, 2.07 and 6.04. Show in the schedule the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project is required. The progress schedule shall be a forward planning and a project monitoring tool.

3.1.1 Level of Detail Required

Develop the Progress Schedule to an appropriate level of detail. Failure to provide an appropriate level of detail, as determined by the Trust

Representative, will result in its disapproval. The Trust Representative will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail as discussed in Paragraphs 3.1.1.1 through 3.1.1.5.

3.1.1.1 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days. Procurement activities are defined herein.

3.1.1.2 Procurement Activities

The schedule must include activities associated with the submittal, approval, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days. A typical procurement sequence includes the string of activities: submit, approve, procure, fabricate, and deliver.

3.1.1.3 Mandatory Tasks

The following tasks must be included and properly scheduled:

- a. Submission and approval of record survey and as-built drawings.
- b. Contractor's pre-final inspection.
- c. Punchlist from Contractor's pre-final inspection.
- d. Trust's pre-final inspection.
- e. Punch list from Trust's pre-final inspection.
- f. Final inspection.
- g. Budgeted adverse weather days for each month.

3.1.1.4 Trust Activities

Show Trust activities that could impact progress. These activities include, but are not limited to: inspections, Trust Furnished Equipment (TFE) and NTP for phasing requirements.

3.1.1.5 Activity Responsibility Coding

Assign responsibility Code for all activities to the Prime Contractor, Subcontractor, or Trust Representative responsible for performing the activity. Activities coded with a Trust Responsibility code include, but are not limited to: Trust approvals, TFE, and NTP for phasing requirements. Code all activities not coded with a Trust Responsibility code to the Prime Contractor or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility code.

3.1.2 Schedule Interval and Activity Calendars

The schedule interval shall extend from NTP date to the required contract completion date. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified including weekends and holidays. Original durations must account for anticipated normal adverse weather. The Trust will interpret all work periods not identified as non-work periods on each calendar as meaning the Contractor intends to perform work during those periods.

3.1.3 Milestones

The schedule must include milestone activities for each significant project event.

3.1.4 Adverse Weather Days

The schedule must reflect Contractor's anticipated delays due to adverse weather and must show that the critical path will not be affected by seasonally normal adverse weather. The schedule must include the budgeted adverse weather days for each month, in accordance with Section 01140 GENERAL REQUIREMENTS. A request for time extension will only be considered in the event that unusually severe weather causes an actual delay to the completion of the project.

3.2 PERIODIC SCHEDULE UPDATES

Based on the result of the meeting, specified in Paragraph PERIODIC SCHEDULE UPDATE MEETINGS below, submit periodic schedule updates. These submittals will enable the Trust Representative to assess the Contractor's progress. If the Contractor fails or refuses to furnish the information and Progress Schedule data, which in the judgment of the Trust Representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.3 SCHEDULE STATUS REPORTS

Contractor shall provide a Schedule Status Report on a weekly basis that documents current weeks activities and accomplishments and forecasts work for the following two weeks. If, in the opinion of the Trust Representative, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including any steps required by the Trust Representative, without additional cost to the Trust. In this circumstance, the Trust Representative may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction, and to submit for approval any supplementary schedule or schedules as the Trust Representative deems necessary to demonstrate how the approved rate of progress will be regained.

3.4 WEEKLY PROGRESS MEETINGS

Prepare and provide a schedule status report to the Trust prior to each weekly progress meeting.

The Trust and the Contractor shall meet weekly (or as otherwise mutually agreed to) between the meetings for the purpose of jointly reviewing the actual progress of the project as compared to the as-planned progress and to review planned activities for the upcoming two weeks. The then current and approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Trust Representative shall attend. The weekly progress meeting will address the status of RFI's, RFP's and Submittals.

The Trust and the Contractor shall jointly review the Schedule Status Reports. If it appears that activities on the longest path(s) which are currently driving the calculated completion date (driving activities), are not progressing satisfactorily and therefore could jeopardize timely project completion, corrective action shall be taken immediately. Corrective action includes but is not limited to: increasing the number of work crews; increasing the number of work shifts; increasing the number of hours worked per shift; and determining if Trust responsibility coded activities require Trust corrective action.

3.5 PERIODIC SCHEDULE UPDATE MEETINGS

Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, and maintaining schedule accuracy. Meetings shall occur at least monthly and after the Contractor has updated the schedule with Trust concurrence respecting actual start dates, actual finish dates, remaining durations and percent complete for each activity it intends to status.

3.6 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor believes it is entitled to an extension of the contract performance period, completion date, or any interim milestone date, furnish the following for a determination by the Trust Representative: justification, Progress Schedule data, and supporting evidence as the Trust Representative may deem necessary. Submission of proof of excusable delay is a condition precedent to any approvals by the Trust. In response to each Request For Proposal issued by the Trust, the Contractor shall submit a schedule impact analysis demonstrating whether or not the change contemplated by the Trust impacts the critical path.

The Progress Schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Trust Representative's determination as to the number of allowable days of contract extension shall be based upon the Progress Schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay, will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Trust Representative within 2 weeks of the NTP being issued. The Trust Representative will approve proposed revisions to the schedule prior to inclusion of those changes

within the Progress Schedule. If the Contractor fails to submit the proposed revisions, the Trust Representative may furnish the Contractor with suggested revisions to the Progress Schedule. The Contractor shall include these revisions in the Progress Schedule until revisions are submitted and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Trust Representative, advise the Trust Representative within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Trust Representative's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Trust Representative's proposed revisions, the Contractor will be deemed to have concurred with the Trust Representative's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.8 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Trust or the Contractor.

-- End of Section --

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL DESCRIPTIONS (SD)

Submittal requirements are specified in the Technical specifications. Submittals are identified by SD numbers and titles as follows. Some submittals listed below may not be required.

SD-01 Preconstruction Submittals

Submittals which are required prior to start of construction (work). Examples of preconstruction submittals include, but are not limited to, Accident Prevention Plan/Site Safety And Health Plan (APP/SSHP), Environmental Protection Plan (EPP), Quality Control Plan, Construction Site Plan, etc.

Preconstruction submittals are indicated in the Paragraph SUBMITTALS in each Technical Specification Section, when applicable, and in the preliminary submittal register.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

1.2 SUBMITTAL CATEGORIES

Submittals are classified as follows:

Trust Representative Approved (T)

Trust Representatives approval is required for extensions of design, critical materials, variations/deviations, an "or equal" decision, equipment whose compatibility with the entire system must be checked, architectural items such as Color Charts/Patterns/Textures, and other items as designated by the Trust Representative.

For Information Only

Submittals not requiring Trust Representatives approval will be for information only. These are items such as Installation Procedures, Certificates of compliance, Samples, Qualifications, etc. These submittals will not be acted on as "shop drawings" within the terms of the Contract Article 6.17.

1.3 SUBMITTAL COORDINATION MEETING

After the preconstruction conference and before any submittals are sent to the Trust Representative, the Contractor shall meet with the Trust Representative to further develop an approved submittal register for the basic contract submittal items. A preliminary submittal register listing the basic contract submittal items will be provided by the Trust as an excel spreadsheet. During the meeting all required items will be identified and grouped into one of the categories defined in paragraph "SUBMITTAL CATEGORIES."

1.3.1 Submittal Review Periods

In preparing the submittal schedule dates, adequate time (minimum of 10 working days) shall be allowed for Trust Representative review and approval, and possible resubmittal of each item on the register. Submittals shall be submitted within the time frame required by the Trust Representative. The final submittal register shall be coordinated with the progress schedule and submitted within 15 working days of the contract notice to proceed.

1.4 APPROVED SUBMITTALS

The approval of submittals by the Trust Representative shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract, is responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work. After submittals have been approved by the Trust Representative, no resubmittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution is necessary.

1.5 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Trust Representative and promptly furnish a corrected submittal in the form specified for Trust Representative approval. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, notice as required under the Contract Article 10, shall be given promptly to the Trust Representative.

1.6 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.7 PAYMENT

Separate payment will not be made for submittals, and all costs associated therein shall be included in the applicable unit prices or lump sum prices contained in the schedule.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 GENERAL

Prior to submittal, all items shall be checked and approved by the Contractor's CQC and each item of the submittal shall be stamped, signed, and dated. Each respective transmittal form shall be signed and dated by the CQC certifying that the accompanying submittal complies with the contract requirements. This procedure applies to all submittals. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Submittals shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. The Trust Representative may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. The Contractor shall maintain a complete and up-to-date file of all submittals/items on site for use by both the Contractor and the Trust Representative.

3.2 SUBMITTAL REGISTER

The submittal register shall be developed by the Contractor prior to the submittal coordination meeting and shall list each item of equipment and material for which submittals are required in the Technical Specifications. (See paragraph SUBMITTALS at the beginning of each specification section). The Contractor shall approve all items listed on the submittal register. During the submittal coordination meeting, the submittal register will be reviewed. When the final submittal register is submitted for approval, the Contractor shall complete the column entitled "Item No." and all data under "Contractor Schedule Dates" and return the completed register to the Trust Representative for approval. The Contractor shall review the list to ensure its completeness and may expand general category listings to show individual entries for each item. The numbers in column "Item No." are to be assigned sequentially starting with "1" for each specification section. DO NOT pre-assign transmittal numbers when preparing the submittal register. When a conflict exists between the submittal register and a submittal requirement in the technical sections, the technical section shall govern unless otherwise approved by the Trust Representative. The preliminary, and then the final approved submittal register, will become the scheduling documents and will be updated monthly and used to control submittals throughout the life of the contract.

3.3 SCHEDULING

Submittals covering component items forming a system, or items that are interrelated shall be coordinated and submitted concurrently. Certifications shall be submitted together with other pertinent information and/or drawings. Additional processing time beyond 10 days may be shown by the Trust Representative on the submittal register attached in the "Remarks" column, or may be added by the Trust Representative during the coordination meeting. No delays, damages, or time extensions will be allowed for time lost due to the Contractor not properly scheduling and providing submittals.

3.4 TRANSMITTAL FORM

A transmittal form shall be used for submitting both Trust Representative Approved and Information Only submittals in accordance with the contract documents and as directed by the Trust Representative. This form will be

furnished to the Contractor by the Trust. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the Construction Drawings pertinent to the data submitted for each item. The Trust Representative reserves the right to refuse submittals which are improperly completed.

3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.5.1 General

Transmittal forms shall be initiated by the Contractor in accordance with the instructions herein and as described in the Contract, or as directed by the Trust Representative. A standard transmittal form will be furnished by the Trust for the Contractor. Each submittal item shall be listed separately on the form, naming subcontractor, supplier, or manufacturer, applicable specification paragraph number(s), drawing/sheet number, pay item number, and any other information needed to identify the item, define its use, and locate it in the work.

3.5.2 Approval of Submittals

All submittals shall be Contractor approved; however, certain specified submittals will also require Trust Representative approval. Trust Representative approval is required when submittals:

- a. are specially identified for Trust Representative approval, or
- b. are extensions of design, or
- c. represent critical materials, or
- d. involve equipment that must be checked for compatibility with an entire system, or
- e. depict deviation from the contract (such as an "or equal" decision).

All other submittals are for information only.

Before submission, Contractor shall review and correct shop drawings prepared by subcontractors, suppliers, and itself, for completeness and compliance with plans and specifications. Contractor shall not use red markings for correcting material to be submitted. Red markings are reserved for Trust Representative use. Approval by Contractor shall be indicated on each shop drawing by an "Approval" stamp containing information as shown on stamp outline in paragraph CONTRACTOR APPROVAL STAMP. Names and titles of individuals authorized by Contractor to approve shop drawings shall be submitted to Trust Representative. Suppliers' or subcontractors' certifications are not acceptable as meeting this requirement. Submittals not conforming to the requirements of this Section will be returned to the Contractor for correction and resubmittal.

3.5.3 Variations

For submittals which include proposed variations requested by the Contractor, it shall be documented in the transmittal form. The Contractor shall set forth in writing the justification for any variations and annotate such variations on the submittal. Normally, variances are not approved unless there is an advantage to the Trust. The Trust Representative reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 TRUST REPRESENTATIVE APPROVED SUBMITTALS

Upon completion of review of submittals requiring Trust Representative approval, the submittals will be identified as having received approval by being so stamped and dated.

3.6.1 Processing of Trust Representative Approved Submittals

All submittals requiring Trust Representative approval shall be identified by having a completed transmittal form attached to it. Submittals will be reviewed and processed as follows:

- a. Approved as Submitted (Action Code "A"): Shop drawings which can be approved without correction will be stamped "Approved" and will be returned to the Contractor.
- b. Approved Except as Noted (Action Code "B"): Shop drawings which have only minor discrepancies will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted" and returned to the Contractor for correction.
- c. Approved Except as Noted (Action Code "C"): Shop drawings which are incomplete or require more than minor corrections will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted - Resubmission Required" and returned to the Contractor for correction. The Contractor need only resubmit the items of the submittal needing the corrections.
- d. Disapproved (Action Code "D"): Shop drawings which are fundamentally in error, cover wrong equipment or construction, or require extensive corrections, will be returned to the Contractor stamped "Disapproved." An explanation will be furnished on the submitted material or the transmittal form indicating reason for disapproval.
- e. Resubmittal will not be required for shop drawings stamped "Approved as Submitted (Action Code "A") or "Approved Except as Noted (Action Code "B")" unless subsequent changes are made by Contractor or a contract modification. For shop drawings stamped "Approved Except as Noted (Action Code "C") or "Disapproved (Action Code "D")," Contractor shall make corrections required, note any changes by dating the revisions to correspond with the change request date, and promptly resubmit the corrected material. Trust costs incurred after the first resubmittal will be charged to the Contractor.

3.7 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned to Contractor. Approval of the Trust Representative is not required on information only submittals. These submittals will be used for information purposes. The

Trust Representative reserves the right to require the Contractor to resubmit any item found not to comply with the contract. The resubmittal shall be reclassified as Trust Representative Approved submittal. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the Trust Representative from requiring removal and replacement if nonconforming material is incorporated in the work. This does not relieve the Contractor of the requirement to furnish samples for testing by a Trust Representative approved laboratory or check testing by the Trust Representative in those instances where the technical specifications so prescribe.

3.7.1 Processing of Information Only Submittals

All shop drawings submitted for information only shall be submitted prior to delivery of the material or equipment to the jobsite. Each submittal shall be identified by having a completed transmittal form attached to it. Transmittal forms shall be marked as follows to identify the Contractor-approved submittals. The words "Contractor approved - information copy only" shall be placed in the remarks block of the form. Submittals will be monitored and spot checks will be made.

When such checks indicate noncompliance, Contractor will be notified by the same method used for Trust Representative Approvals.

3.8 CONTRACTOR APPROVAL STAMP

The stamp used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR: _____	
CONTRACT NUMBER _____	
TRANSMITTAL NUMBER _____	
ITEM NUMBER _____	
SPECIFICATION SECTION _____	
PARAGRAPH NUMBER _____	
_____ APPROVED AS SUBMITTED	
_____ APPROVED WITH CORRECTIONS AS NOTED	
SIGNATURE: _____	
TITLE: _____	DATE _____

-- End of Section --

SECTION 01351

SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 GENERAL

1.1 SCOPE OF WORK

This section requires contractors to implement practices and procedures for working safely and in compliance with OSHA regulation while performing activities on the Site. Some of the tasks to be performed under this contract will not involve exposure potential to the metals contamination throughout the site; other tasks will. The requirements of this specification section address both types of activities. The critical element for compliance with this specification is performance of activity/job hazard analyses for each task and making sure they are specific to the work site and tasks to be performed.

Hunting and other outdoor recreation activity is common in the area during the late summer and fall months. Heavy hunter traffic may occur on local roads as a result of these activities. Off Highway Vehicle traffic may also increase as a result of hunting activities.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1 (2009) Emergency Eyewash and Shower Equipment

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses

29 CFR 1910 Occupational Safety and Health (OSHA) Standards

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

29 CFR 1910.141 Sanitation

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

29 CFR 1910.212 Safety Standard for Machinery and Machine Guarding

29 CFR 1910.1030 Bloodborne Pathogens

29 CFR 1910.1200	Hazard Communication
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.24	Fire Prevention and Prevention
29 CFR 1926.56	Illumination
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
29 CFR 1926.651	Specific Excavation Requirements
29 CFR 1926.400	Electrical Safety
29 CFR 1926.500	Fall Protection
29 CFR 1926.1118	Inorganic Arsenic
29 CFR 1926.1127	Cadmium
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.3 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan/Site Safety And Health Plan (APP/SSHP); T

An Accident Prevention Plan/Site-specific Safety and Health Plan (APP/SSHP) shall be submitted that meets the requirements of this specification section. Addendums shall be submitted to address work-site/task specific safety and health issues (such as Activity Hazard Analyses, exposure assessment, Personal Protective Equipment (PPE), decontamination facilities, work zones, changes in contractor personnel, pre-work area dust monitoring, etc.) and may reference extensively the initial contract APP/SSHP. The addendums shall also include specific procedures and methods for protecting worker and public health and safety. No work shall begin until the APP/SSHP has been approved. The APP/SSHP shall be signed by an Industrial Hygienist certified by the American Board of Industrial Hygiene or a safety professional certified by the Board of Certified Safety Professionals.

40 Hour Hazardous Waste Operation and Emergency Response Certificates;
T

8 Hour Hazardous Waste Operations and Emergency Response; T

SD-02 Shop Drawings

Work Zones; T

Drawings including typical initial work zone boundaries for each task covered under this contract: Exclusion Zone (EZ), including restricted and regulated areas; Contamination Reduction Zone (CRZ); and Support Zone (SZ). These shall be submitted as part of the APP/SSHP.

Decontamination Facilities; T

Drawings showing the typical layout of the personnel and equipment decontamination areas and facilities for each task under this contract. These shall be submitted as part of the APP/SSHP.

SD-03 Product Data

Site Control Log

Record of each entry and exit into the site, as specified. These shall be submitted at least monthly.

Employee Records

A Record for each worker performing cleanup operations with potential for contaminant-related occupational exposure signed by the Safety and Health Manager indicating the workers meet the training and medical surveillance requirements of this contract. These shall be included in the submittal for the APP/SSHP; any modifications/updates shall be submitted as addendums to the APP/SSHP.

SD-06 Test Reports

Exposure Monitoring Program

Personnel exposure monitoring results. These shall be submitted at the end of the project. The Trust shall be notified as soon as possible, but no later than 24 hours following any results that exceed established action levels.

1.4 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with OSHA requirements in 29 CFR 1910 and 29 CFR 1926, especially OSHA's Standards 29 CFR 1926.65 and 29 CFR 1910.120 and state specific OSHA requirements where applicable. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 PRECONSTRUCTION SAFETY CONFERENCE

A preconstruction safety conference shall be conducted prior to the start of site activities and after submission of the contractor's APP/SSHP. The objective of the meeting will be to discuss health and safety concerns related to the impending work, discuss project health and safety organization and expectations, review and answer comments and concerns regarding the APP/SSHP or other health and safety concerns the contractor

may have. The Contractor shall ensure that those individuals responsible for health and safety at the project level are available and attend this meeting.

1.6 ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN (APP/SSHP)

The Contractor shall develop and implement an APP/SSHP. The APP/SSHP shall address all occupational safety and health hazards (traditional construction as well as contaminant-related hazards) associated with cleanup operations. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP provided each safety and occupational health (SOH) issue receives adequate attention and is documented in the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations/execution change. The APP/SSHP will require modification to address changing and previously unidentified health and safety conditions. It is the Contractor's responsibility to ensure that the APP/SSHP is updated accordingly. Amendments to the APP/SSHP will be submitted to the Trust Representative as the APP/SSHP is updated. For long duration projects the APP/SSHP shall be resubmitted to the Trust Representative annually for review. The APP/SSHP will contain all updates.

1.6.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP shall be signed and dated by the Safety and Health Manager (SHM), Site Safety and Health Officer (SSHO) and the Site Superintendent. The APP/SSHP shall be submitted for review 7 days prior to the Preconstruction Safety Conference. Deficiencies in the APP/SSHP will be discussed at the preconstruction safety conference, and the APP/SSHP shall be revised to correct the deficiencies and resubmitted for acceptance. Onsite work shall not begin until the plan has been accepted. A copy of the written APP/SSHP shall be maintained onsite. Changes and modifications to the accepted APP/SSHP shall be made with the knowledge and concurrence of the SHM, the SSSH, the Site Superintendent, and the Trust Representative. Should any unforeseen hazard become evident during the performance of the work, the SSSH shall bring such hazard to the attention of the SHM, the Site Superintendent, and the Trust Representative for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP/SSHP shall be cause for stopping work until the matter has been rectified.

1.6.2 Availability

The APP/SSHP shall be made available in accordance with 29 CFR 1910.120, (b)(1)(v) and 29 CFR 1926.65, (b)(1)(v).

1.7 TASK SPECIFIC HAZARDS, INITIAL PPE, HAZWOPER MEDICAL SURVEILLANCE AND TRAINING APPLICABILITY

Task specific occupational hazards, task specific HAZWOPER medical surveillance and training applicability and task specific initial PPE requirements for the project are listed in the Site Specific Technical Specifications.

It is the Contractor's responsibility to reevaluate occupational safety and health hazards as the work progresses and to adjust the PPE and onsite

operations, if necessary, so that the work is performed safely and in compliance with occupational safety and health regulations.

1.8 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

1.8.1 Health and Safety Staff Requirements

The SHM and the SSHO shall meet the minimum requirements of this section for education, training, and experience.

1.8.1.1 Safety and Health Manager

The Contractor shall designate an SHM responsible for the development and ongoing maintenance of the APP/SSHP.

a. The SHM shall have the following qualifications:

1. A minimum of 3 years experience in implementing safety and health programs at hazardous waste sites.
2. Documented experience in supervising professional and technician level personnel.
3. Documented experience in developing safety and health programs, including air monitoring, personnel protective equipment, and safety programs for the hazards likely to be encountered on the project.
4. Working knowledge of state and Federal occupational safety and health regulations.

b. The SHM shall:

1. Be responsible for the development of the APP/SSHP.
2. Sign and date the APP/SSHP before submittal.
3. Conduct initial site-specific health and safety training.
4. Be available for consultation or emergencies for the duration of the project.
5. Visit the site as needed for the duration of activities to audit the effectiveness of the APP/SSHP.
6. Coordinate any modifications to the APP/SSHP with the Site Superintendent, SSHO, and the Trust Representative.
7. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.
8. Review accident reports and results of daily inspections.
9. Serve as a member of the Contractor's quality control staff on matters relating to safety and health.

1.8.1.2 Site Safety and Health Officer (SSHO)

An individual shall be designated the SSHO. The name, qualifications (education and training summary and documentation), and work experience of the SSHO and alternate shall be included in the APP/SSHP.

a. The SSHO shall have the following qualifications:

1. A minimum of 2 years experience in implementing safety and health programs at hazardous waste sites where Level C PPE was potentially required.
2. Documented experience in construction techniques and construction safety procedures.
3. Working knowledge of Federal and state occupational safety and health regulations.
4. Specific training in personal and respiratory protective equipment, confined space entry and in the proper use of air monitoring instruments and air sampling methods including monitoring for ionizing radiation.

b. The SSHO shall:

1. Conduct onsite training and the day to day onsite implementation and enforcement of the accepted APP/SSHP.
2. Be assigned to the site on a full time basis for the duration of field activities. The SSHO can have collateral duties in addition to Safety and Health related duties, such as Contractor Quality Control Systems Manager. If operations are performed during more than 1 work shift per day, a SSHO shall be present for each shift.
3. Have authority to ensure site compliance with specified safety and health requirements, Federal, state and OSHA regulations and all aspects of the APP/SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.
4. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.
5. Consult with and coordinate any modifications to the APP/SSHP with the Site Superintendent, and the Trust Representative.
6. Serve as a member of the Contractor's quality control staff on matters relating to safety and health.
7. Conduct accident investigations and prepare accident reports.

8. Conduct daily safety inspection and document safety and health findings into the Daily Safety Inspection Log. Track noted safety and health deficiencies to ensure that they are corrected.
9. Recommend corrective actions for identified deficiencies and oversee the corrective actions.

1.8.2 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910.1030. These persons may perform other duties but shall be immediately available to render first aid when needed.

1.9 TRAINING

The Contractor's training program for workers performing cleanup operations or tasks covered under this contract who will be exposed to contaminants shall meet the following requirements. If there is no potential for exposure, requirements of Paragraphs 1.9.2 through 1.9.4 are still required.

1.9.1 General Hazardous Waste Operations Training

All Personnel performing duties with potential for exposure to onsite contaminants shall meet and maintain the following 29 CFR 1910.120/29 CFR 1926.65(e) training requirements:

- a. 40 Hour hazardous waste operation and emergency response certificates.
- b. 8 Hour hazardous waste operations and emergency response annually.
Onsite supervisors shall have an additional 8 hours management and supervisor training specified in 29 CFR 1910.120/29 CFR 1926.65(e)(4).

1.9.2 Pre-entry Briefing

Prior to commencement of onsite field activities, all site employees, including those assigned only to the SZ, shall attend a site-specific safety and health training session. This session shall be conducted by the Safety and Health Manager and the SSHO to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Procedures and contents of the accepted APP/SSHP shall be thoroughly discussed. Each employee shall sign a training log to acknowledge attendance and understanding of the training. The Trust Representative shall be notified at least 5 days prior to the initial site-specific training session so Trust or other interested personnel involved in the project may attend.

1.9.3 Periodic Sessions

Periodic onsite training (tailgate safety briefings) shall be conducted by the SSHO at least daily for personnel assigned to work at the site. The training shall address safety and health procedures, work practices, any changes in the APP/SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents.

Should an operational change affecting onsite field work be made, a meeting prior to implementation of the change shall be convened to explain safety and health procedures. Site-specific training sessions for new personnel, visitors, and suppliers shall be conducted by the SSHO using the training curriculum outlines developed by the SHM. Each employee shall sign a training log to acknowledge attendance and understanding of the training.

1.9.4 Other Training

Special site specific training requirements could include Lead in Construction as specified by 29 CFR 1926.62(1), Blood Borne Pathogen training as specified in 29 CFR 1910.1030, and First Aid/CPR training (for a minimum of two people). The SHM shall provide training as specified by 29 CFR 1910.146, for employees who are required to supervise, standby, or enter permit-required confined spaces. Persons involved in the transportation of hazardous materials shall be trained in accordance with 49 CFR 172 Subpart H, if required by the standard.

1.10 PERSONAL PROTECTIVE EQUIPMENT

1.10.1 Site Specific PPE Program

Onsite personnel exposed to contaminants shall be provided with appropriate PPE. Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) shall be used. Protective equipment and clothing shall be kept clean and well maintained. The PPE section of the APP/SSHP shall include site-specific procedures to determine PPE program effectiveness level, and for onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

1.10.2 Levels of Protection

The SHM shall establish and evaluate as the work progresses the levels of protection for each work activity. The SHM shall also establish action levels for upgrade or downgrade in levels of PPE. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE evaluation protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.10.2.1 Components of Protection

The following items constitute initial minimum protective clothing and equipment ensembles.

- a. Level D. Hard hats, steel toe/shank work boots, safety glasses, minimum short-sleeve shirt, long pants, gloves (as necessary), ear plugs/muffs (as necessary).
- b. Additional levels of PPE may be required and shall be identified in the SSHP.

1.10.2.2 Initial Minimum Levels of PPE by Task

Based on the work to be performed and the contaminants/materials involved, the Contractor shall determine the necessary minimum levels of protection by task. Available site information shall be reviewed and the list of tasks and operations and the levels of protection shall be expanded and/or revised during preparation of the APP/SSHP.

1.10.3 PPE for Trust and Government Personnel

Three clean sets of PPE and clothing (excluding air-purifying negative pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the EZ and/or CRZ, shall be available for use by the Trust Representative, its visitors, or agency visitors. The Contractor shall provide basic training in the use and limitations of the PPE provided.

1.11 MEDICAL SURVEILLANCE PROGRAM

The Contractor's medical surveillance program for workers performing cleanup operations shall be completed as stated in Contractor's Corporate Health and Safety Plan.

1.12 EXPOSURE MONITORING PROGRAM

The Contractor shall prepare and implement an exposure monitoring program to comply with OSHA requirements and assure proper selection of engineering controls, work practices and PPE for affected site personnel. The exposure monitoring shall be utilized to perform initial exposure assessments in accordance with 29 CFR 1926.62(d), 29 CFR 1926.1118(d), and 29 CFR 1926.1127(d). Include action levels for upgrading/downgrading PPE in the program. The Contractor shall monitor for total dust by collecting samples consistent with NIOSH 0500 or using a real-time dust monitor calibrated and maintained in accordance with the equipment manufacturer's specifications. The contractor shall monitor for lead, cadmium, and arsenic in accordance with NIOSH 7300 or OSHA 125G. American Industrial Hygiene Association (AIHA) accredited laboratory shall be used to analyze all samples collected for personal exposure monitoring. Prior to start of work for each project site perform area dust monitoring to establish background total dust and to select the appropriate level of PPE. Perform personal exposure monitoring at an appropriate frequency and coverage for site specific work tasks and define the action levels requiring a modification of initial PPE selection.

1.13 HEAT AND COLD STRESS MONITORING AND MANAGEMENT

The Contractor shall document in the APP/SSHP procedures and practices to monitor and manage heat and cold stress. The SHM shall develop a heat stress and cold stress monitoring program for on-site activities. Details of the monitoring program, including schedules for work and rest, and physiological monitoring requirements, shall be described in the APP/SSHP. Personnel shall be trained to recognize the symptoms of heat and cold stress. The SSHO and an alternate person shall be designated, in writing, to be responsible for implementing the heat and cold stress monitoring program.

1.14 CONFINED SPACE ENTRY PROCEDURES

Confined space entry procedures shall address requirements of 29 CFR 1910.146. Confined spaces shall be identified during the hazard evaluation.

1.15 HOT WORK

Hot work safety requirements contained in 29 CFR 1926.352 shall be addressed.

1.16 IGNITION SOURCES

Ignition sources shall be identified which could pose potential fire hazards or other hazards at the various sites.

1.17 FIRE PROTECTION AND PREVENTION

Fire protection and prevention requirements 29 CFR 1926.24 shall be addressed.

1.18 ELECTRICAL SAFETY

Electrical safety requirements 29 CFR 1926.400 shall be addressed.

1.19 EXCAVATION AND TRENCH SAFETY

Excavation and trench safety requirements 29 CFR 1926.651 shall be addressed.

1.20 GUARDING OF MACHINERY AND EQUIPMENT

Guarding of machinery and equipment requirements of 29 CFR 1910.212 shall be addressed.

1.21 LOCKOUT/TAGOUT

Lockout/tagout requirements of 29 CFR 1910.147 shall be addressed.

1.22 FALL PROTECTION

Fall protection and safe access requirements of 29 CFR 1926.500 shall be addressed.

1.23 HAZARD COMMUNICATION

Hazard communication requirements of 29 CFR 1910.1200 shall be addressed.

1.24 ILLUMINATION

Illumination requirements of 29 CFR 1926.56 shall be addressed.

1.25 SANITATION

Sanitation requirements of 29 CFR 1910.141 shall be addressed.

1.26 ENGINEERING CONTROLS

Engineering controls to be used to mitigate against task hazards shall be addressed. Dust control shall be included in this discussion.

1.27 SIGNS AND LABELS

Signs and labels shall be addressed as necessary to comply with 29 CFR 1910.1200.

1.28 SITE CONTROL MEASURES

1.28.1 Work Zones

Initial anticipated work zone boundaries (EZ, CRZ, SZ, all access points and decontamination areas) are to be clearly delineated by the Contractor prior to start of work in each work zone; a general description of work zone set up based on anticipated tasks shall be discussed in the APP/SSHP. Delineation of work zone boundaries shall be based on the contamination characterization data and the hazard/risk analysis to be performed. As work progresses and field conditions change, work zone boundaries may be modified (using site maps showing the modified boundaries) with approval of the Trust Representative.

A site map, showing work zone boundaries and locations of decontamination facilities, shall be posted in the onsite office. Work zones shall consist of the following:

- a. Exclusion Zone (EZ): The EZ is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area shall be controlled and exit may only be made through the CRZ.
- b. Contamination Reduction Zone (CRZ): The CRZ is the transition area between the EZ and the SZ. The personnel and equipment decontamination areas shall be separate and unique areas located in the CRZ.
- c. Support Zone (SZ): The SZ is defined as areas of the site, other than EZs and CRZs, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The SZ shall be secured against active or passive contamination. Site offices, parking areas, and other support facilities shall be located in the SZ.

1.28.2 Site Control Log

A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the EZ (if applicable). Before visitors are allowed to enter the CRZ or EZ, they shall show proof of current training, medical surveillance, and respirator fit testing (if respirators are required for the tasks to be performed) and shall fill out a Certificate of Worker or Visitor Acknowledgment. This visitor information, including date, shall be recorded in the log. The Contractor is not required to "man" the log during the day, but shall review the log at the end of the day to determine whether all personnel visiting, entering, or working on the site have signed in and out.

1.28.3 Site Security

The Contractor shall establish site security procedures that meet the work zone requirements given in Paragraph 1.28.1. The Trust's Representative shall be given copies of keys or combinations to locks that the Contractor places on gates, if gates and locks are used.

1.29 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the EZs or CRZs or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids shall decontaminate themselves and their equipment prior to exiting the CRZ and entering the SZ. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers shall be submitted as part of the APP/SSHP. Employees shall be trained in the procedures and the procedures shall be enforced throughout site operations.

1.29.1 Decontamination Facilities

The Contractor shall describe the types of decontamination facilities to be utilized for the various tasks; site specific decontamination facilities and procedures shall be established based on site specific/task specific requirements. Showers, if needed, must comply with 29 CFR 1910.141. It is the SSO's responsibility to recommend techniques to improve personnel decontamination procedures, if necessary. Initial personnel decontamination equipment shall be described in the APP/SSHP.

1.29.2 Equipment Decontamination

Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site.

1.29.2.1 Facilities for Equipment and Personnel

A vehicle/equipment decontamination station shall be provided within the CRZ for decontaminating vehicles and equipment leaving the EZ. The Contractor shall determine the most effective means of decontaminating vehicles/equipment based on the task specific hazard analysis performed. The APP/SSHP shall discuss reasonable methods to be considered, based on the tasks covered under this contract. If a designated "clean area" in the CRZ for performing equipment maintenance is required, this shall be addressed in the APP/SSHP. This area shall be used when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ shall be decontaminated before maintenance is performed.

1.29.2.2 Procedures

Procedures for equipment decontamination shall be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures shall address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Any item taken into the EZ shall be assumed to be contaminated and shall be inspected and decontaminated before being allowed to enter the SZ. Vehicles, equipment, and materials shall be cleaned and decontaminated prior to leaving the site. Construction material shall be handled in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination.

1.30 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

The following items, as a minimum, shall be maintained onsite and available for immediate use:

- a. First aid equipment and supplies.
- b. Emergency eyewash stations and showers that comply with ANSI Z358.1, if required for employee protection based on the task hazard analysis.
- c. Fire extinguishers of sufficient size and type shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

1.31 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

An Emergency Response Plan, that meets the requirements of 29 CFR 1910.120(l) and 29 CFR 1926.65(l), shall be developed and implemented as a section of the APP/SSHP. In the event of any emergency associated with remedial action, the Contractor shall, without delay, alert all onsite employees and as necessary offsite emergency responders that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Trust Representative; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Employees that are required to respond to hazardous emergency situations shall be trained to their level of responsibility according to 29 CFR 1910.120(q) and 29 CFR 1926.65(q) requirements. The plan shall be rehearsed regularly as part of the overall training program for site operations. The plan shall be reviewed periodically and revised as necessary to reflect new or changing site conditions or information. Copies of the Emergency Response Portion of the accepted APP/SSHP shall be provided to the affected local emergency response agencies. The following elements, as a minimum, shall be addressed in the plan:

- a. Pre-emergency planning. The Contractor shall coordinate with local emergency response providers during preparation of the Emergency Response Plan. At a minimum, coordinate with local fire, rescue, hazardous materials response teams, police and emergency medical providers to assure all organizations are capable and willing to respond to and provide services for on-site emergencies. The Contractor shall ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.
- b. Personnel roles, lines of authority, communications for emergencies.
- c. Emergency recognition and prevention.
- d. Site topography, layout, and prevailing weather conditions.
- e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).
- f. Specific procedures for decontamination and medical treatment of injured personnel.

- g. Route maps to nearest pre-notified medical facility. Site-support vehicles shall be equipped with maps. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.
- h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as the SHM, the SSHO, the Site Superintendent, the Trust Representative and/or their alternates).
- i. Criteria for initiating community alert program, contacts, and responsibilities.
- j. Procedures for reporting incidents to appropriate Trust. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate Trust shall be immediately notified. In addition, the Trust Representative and the local district safety office shall be verbally notified immediately and receive a written notification within 24 hours. The report shall include the following items:
 - 1. Name, organization, telephone number, and location of the Contractor.
 - 2. Name and title of the person(s) reporting.
 - 3. Date and time of the incident.
 - 4. Location of the incident, i.e., site location, facility name.
 - 5. Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
 - 6. Cause of the incident, if known.
 - 7. Casualties (fatalities, disabling injuries).
 - 8. Details of any existing chemical hazard or contamination.
 - 9. Estimated property damage, if applicable.
 - 10. Nature of damage, effect on contract schedule.
 - 11. Action taken to ensure safety and security
 - 12. Other damage or injuries sustained, public or private.
- k. Procedures for critique of emergency responses and follow-up.

1.32 INSPECTIONS

The SSHO's Daily Inspection Logs shall be attached to and submitted with the Daily Quality Control reports. Each entry shall include the following: date, work area checked, employees present in work area, PPE and work equipment

being used in each area, special safety and health issues and notes, and signature of preparer.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

-- End of Section --

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SECTION 01355

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

This section covers the requirements for protection of the human health and the natural environment during all construction activities, including but not limited to mobilization, earthwork, and site restoration. This includes furnishing all labor, materials, equipment and incidentals required to provide environmental pollution and damage control.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z60.1 (2004) Nursery Stock

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 262 Standards Applicable to Generators of Hazardous Waste

40 CFR 279 Standards for the Management of Used Oil

40 CFR 302 Designation, Reportable Quantities, and Notification

40 CFR 355 Emergency Planning and Notification

40 CFR 68 Chemical Accident Prevention Provisions

49 CFR 171 - 178 Hazardous Materials Regulations

1.3 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan (EPP); T

The purpose of the EPP is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction.

1.4 DEFINITIONS

1.4.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.4.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.4.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, and waste solvents.

1.5 SUBCONTRACTORS

Assurance of compliance with this Section by subcontractors will be the responsibility of the Contractor.

1.6 ENVIRONMENTAL PROTECTION PLAN (EPP)

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an EPP for review and approval by the Trust Representative. The purpose of the EPP is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the EPP as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the EPP, the Contractor shall meet with the Trust Representative for the purpose of discussing the implementation of the initial EPP; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's EPPs. The EPP shall be current and maintained onsite by the Contractor. This plan shall contain a complete description of all water-quality monitoring activities to occur during construction, if applicable. This plan shall govern site activities relating to pollution prevention and minimization, spill control and reporting, storm-water management, noise and dust control, and compliance with State and Federal water, wastewater, air, and solid waste regulations.

1.6.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, state, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the EPP.

1.6.2 Contents

The EPP shall include, but shall not be limited to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the EPP.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- f. An erosion control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to ensure that the control measures are in compliance with the erosion and sediment control plan and with Federal, state, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.
- g. Construction Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.
- h. Stream re-routing plan. Plan shall include measures to divert stream water flow around construction areas as indicated on the Construction Drawings, if applicable.
- i. Traffic control plans. Plan shall include material hauling procedures, necessary haul road improvements, and temporary access road improvements.
- j. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
- k. A spill prevention, control and countermeasure (SPCC) plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under state or local laws and

regulations. In addition, the SPCC shall include storage and housekeeping procedures. The plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Trust Representative in addition to the legally required Federal, state, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.
 2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.
 3. Training requirements for Contractor's personnel and methods of accomplishing the training.
 4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
 5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
 6. The methods and procedures to be used for expeditious contaminant cleanup.
1. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a report detailing the non-hazardous solid waste diversion activities and indicating the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October).
 - m. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, state, regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.
 - n. An air pollution control plan detailing provisions to ensure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site. The plan shall describe the Contractor's visual air monitoring program. It shall describe the steps the Contractor will

take to modify site activities to further control dust if the results of the visual air monitoring program or the results of the Trust-representative perimeter air monitoring program, as described in the QAPP, indicate unacceptable levels of dust.

- o. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, state, and local laws and regulations for storage and handling of these materials. A copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.
- p. A wastewater management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as clean-up water, dewatering of ground water, and disinfection water.
- q. A biological resources plan that defines procedures for identifying and protecting biological resources known to be on the project site and/or identifies procedures to be followed if biological resources not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to ensure the protection of known or discovered resources and shall identify lines of communication between Contracting personnel and the Trust Representative.
- r. The Trust will provide the Contractor with a Cultural Field Response Plan (CFRP) for Unanticipated Discoveries that will include methods to ensure the protection of known or discovered prehistoric, historic, archeological, or cultural resources and shall identify lines of communication between Contractor personnel and the Trust Representative. The EPP shall incorporate the CFRP by reference.

1.6.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the EPP.

1.7 PROTECTION FEATURES

Prior to start of any onsite construction activities, the Contractor and the Trust Representative shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection, which are not specifically identified on the Construction Drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to construction areas and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor and the Trust Representative upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the Construction Drawings, regardless of

interference that their preservation may cause to the Contractor's work under the contract.

1.8 SPECIAL ENVIRONMENTAL REQUIREMENTS

The Contractor shall comply with all special environmental requirements listed in this section.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the Construction Drawings, plans and specifications which may have an environmental impact will be subject to approval by the Trust Representative and may require an extended review, processing, and approval time. The Trust Representative reserves the right to disapprove alternate methods, even if they are more cost effective, if the Trust Representative determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Trust Representative will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. The Contractor shall, after receipt of such notice, inform the Trust Representative of the proposed corrective action and take such action when approved by the Trust Representative. The Trust Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Trust Representative may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.11 VISUAL AIR MONITORING

For the duration of construction activities the Contractor shall continuously monitor for visual dust. A perimeter monitoring check shall be performed on an interval of once every four hours for which the results of this monitoring shall be recorded in the Contractor daily notes.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine all activities to areas defined by the Construction Drawings and specifications. Certain areas as indicated on the Construction Drawings shall not be disturbed and shall be marked or fenced with orange safety fence. Foundations and structures shall be left undisturbed and in place, unless indicated on the Construction Drawings or directed by the Trust Representative.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the Construction Drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the Construction Drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized.

3.2.1 Protection of Landscape Features

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the Construction Drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

Care shall be exercised by the Contractor when excavating trenches in the vicinity of trees. Where roots are 2 inches in diameter or greater, the trench shall be excavated by hand and tunneled. When large roots are exposed, they shall be wrapped with heavy burlap for protection and to prevent drying. Trenches dug by machines adjacent to trees having roots less than 2 inches in diameter shall have the sides hand trimmed making a clean cut of the roots. Trenches having exposed tree roots shall be backfilled within 24 hours unless adequately protected by moist burlap or canvas.

3.2.2 Restoration of Landscape Features

All landscape features (vegetation - such as trees, plants, and grass) damaged or destroyed during Contractor operations outside and within the work areas shall be restored to a condition similar to that which existed prior to construction activities unless otherwise indicated on the Construction Drawings or in the specifications. This restoration shall be done at no additional cost to the Trust. If the Contractor fails or refuses to repair the damage promptly, the Trust may have the necessary work performed and charge the cost to the Contractor.

Trees shall be replaced in kind with a minimum 4-inch caliper nursery stock. Shrubs, vines, and ground cover shall be replaced in kind; size to be approved by the Trust Representative. All plant material shall meet specifications outlined in ANSI Z60.1 - current publication, "American Standard for Nursery Stock."

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as indicated

on the Construction Drawings or as directed by the Trust Representative. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the Construction Drawings or as directed by the Trust Representative. Contractor shall limit equipment and materials storage to the smallest area practical and shall store only equipment and material used for the Work in the construction area. Temporary movement or relocation of Contractor facilities shall be made only when approved.

3.3 WATER RESOURCES

The Contractor will not be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit; however, the Contractor must meet the substantive requirements of the NPDES General Permit for Stormwater Discharges from Construction Activities in accordance with the EPP. When sampling is required, the Contractor shall sample and analyze stormwater discharging off-site in accordance with procedures outlined in the EPP. Samples shall be collected to monitor turbidity and to visually monitor for the presence of sediment and sheen.

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters and shall maintain all existing drainage patterns unless otherwise specified in the Construction Drawings. Conveyance swales, ditches, and other areas at the Site shall be clear of debris, materials, and equipment that may disrupt drainage. All attempts shall be made to utilize BMPs at the work site such that water turbidity does not exceed 25 NTU at the point of compliance. If visible turbidity exists at the point of compliance due to disturbances upstream from construction activities, the Contractor shall verify by measurement. If an exceedance occurs or appears to be imminent, corrective action shall be performed to mitigate the situation. Mitigation may include halting certain construction activities.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations for dewatering and diverting shall be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. The Contractor shall comply with the Federal and State of Idaho water quality standards and anti-degradation provisions. Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure will be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. The Contractor shall comply with the requirements of the Clean Water Act Section 404 Nation Wide Permit. The Trust will provide the Contractor with project-specific information regarding the Clean Water Act Section 404 Nation Wide Permit.

3.3.2 Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles, aerosols, and gaseous byproducts from construction activities, processing, and preparation of materials shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and state allowable limits at all times. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Idaho rules and local noise ordinances.

3.4.4 Burning

Burning shall be completed as stipulated by State and County regulations. Only native slash and debris may be burned on site.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the Construction Drawings.

3.5.1 Solid Wastes

No littering will be allowed within the construction area. The Contractor shall provide and maintain suitable garbage receptacles at the staging area

and other locations within the construction area as appropriate. The garbage receptacles shall be secured to prevent loss of contents by weather or wildlife. The Contractor shall inform employees and Subcontractors of the locations of the garbage receptacles, instruct them not to litter, and require that all garbage generated on-site is properly disposed. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal.

3.5.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation may be periodically reviewed by the Trust Representative. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations. A manifest of chemical disposal may be requested by the Trust Representative.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Trust Representative. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

3.5.5 Waste Water

Waste water from construction activities, such as onsite material processing, etc. shall not be allowed to enter waterways of the State of Idaho prior to verification that discharges meet federal, state, and local

water pollution control standards, anti-degradation standards, and water quality criteria. The Contractor shall dispose of the construction related waste water off-property in accordance with all Federal, State, Regional and Local laws and regulations.

3.6 HISTORICAL, ARCHEOLOGICAL AND CULTURAL RESOURCES

Site-specific procedures for protecting historic archeological resources will be specified in a Cultural Field Response Plan (CFRP) for Unanticipated Discoveries to be provided by the Trust. Project personnel (excepting approved archaeologists) shall not for personal observation or use collect, move or in any other way alter any prehistoric or historic artifacts or features in the project vicinity.

If during excavation or other construction activities any previously unidentified or unanticipated potential prehistoric archaeological resources and/or human remains/burial(s) are discovered or found, all activities that may damage or alter such resources shall be suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; prehistoric artifacts such as - formed stone tools, for example projectile points (arrowheads of spear points), scrappers, and/or the debitage (flakes or chips) left over from forming tools; fire pits/rings; rock art, such as pictographs (rock paintings) or petroglyphs (pecked rock art and/or any other artifacts and/or features indicating other prehistoric human activities. Upon such discovery or find, the Contractor shall immediately notify the Trust Representative so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.7 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, and local laws and regulations.

3.8 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.9 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.10 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.11 CONTAMINATED MEDIA MANAGEMENT

Contaminated environmental media shall be managed in accordance with the ICP program and the Site Specific Technical Specifications.

3.12 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Article 6.11.c (Cleaning). The Contractor shall, unless otherwise instructed in writing by the Trust Representative, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g., ASTM B564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes. the date of issue for that document will instead be used.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
38800 Country Club Drive
Farmington Hills, MI 48331
Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: <http://www.concrete.org>

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)
444 North Capital Street, NW, Suite 249
Washington, DC 20001
Ph: 202-624-5800
Fax: 202-624-5806
E-Mail: info@aaashto.org
Internet: <http://www.aashto.org>

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1819 L Street, NW, 6th Floor
Washington, DC 20036
Ph: 202-293-8020
Fax: 202-293-9287
E-mail: info@ansi.org
Internet: <http://www.ansi.org/>

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION
(AREMA)

10003 Derekwood Lane, Suite 210
Lanham, MD 20706
Ph: 301-459-3200
Fax: 301-459-8077
Internet: <http://www.arema.org>

AMERICAN SOCIETY OF AGRONOMY, INC. (ASA)/SOIL SCIENCE SOCIETY OF
AMERICA, INC. (SSSA)

American Society Of Agronomy, Inc. (ASA)
5585 Guilford Road
Madison, WI 53711-5801
Ph: 608-273-8080
Internet: <https://www.agronomy.org/>

-and-

Soil Science Society Of America, Inc. (SSSA)
5585 Guilford Road
Madison, WI 53711-5801
Ph: 608-273-8080
Internet: <https://www.soils.org/>

AMERICAN WELDING SOCIETY (AWS)

550 N.W. LeJeune Road
Miami, FL 33126
Ph: 800-443-9353 - 305-443-9353
Fax: 305-443-7559
E-mail: info@aws.org or customerservice@awspubs.com
Internet: <http://www.aws.org>

ASTM INTERNATIONAL (ASTM)

100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
Fax: 610-832-9555
E-mail: service@astm.org
Internet: <http://www.astm.org>

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

933 North Plum Grove Road
Schaumburg, IL 60173-4758
Ph: 847-517-1200 or 800-328-6306
Fax: 847-517-1206
Internet: <http://www.crsi.org/>

DEPARTMENT OF ECOLOGY - STATE OF WASHINGTON (DE-WA)

300 Desmond Drive, Lacey, WA 98503-1274
Ph: 360-407-6000
Fax: 360-407-6989

GEOSYNTHETIC INSTITUTE (GSI)

475 Kedron Avenue
Folsom, PA 19033 1208
Ph: 610-522-8440
Fax: 610-522-8441

E-mail: mvashley@verizon.net
Internet: <http://www.geosynthetic-institute.org>

IDAHO TRANSPORTATION DEPARTMENT (ITD)
Idaho Transportation Department
3311 W. State Street P.O. Box 7129
Boise, ID 83707-1129
Ph: 208-334-8000
Internet: <http://itd.idaho.gov>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000 or 800-344-3555
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: <http://www.nfpa.org>

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
Mail Stop C-34
4676 Columbia Parkway
Cincinnati, OH 45226
Ph: 513-533-8611
Fax: 513-533-8285
E-mail: nioshdocket@cdc.gov
Internet: <http://www.cdc.gov/nchs/products.htm>

NATIONAL READY MIXED CONCRETE ASSOCIATION (NRMCA)
900 Spring Street
Silver Spring, MD 20910
Ph: 240-485-1165
E-mail: jjenkins@nrmca.org (jacques jenkins)
Internet: <http://www.nrmca.org>

STATE OF IDAHO ADMINISTRATIVE CODE (IC)
Department of Administration
999 Main Street, Suite 910
Boise, ID 83702
Ph: 208-332-0102
Fax: 208-332-0106
E-mail: rulescoordinator@adm.idaho.gov
Internet: <http://adminrules.idaho.gov>

STATE OF IDAHO ADMINISTRATIVE PROCEDURES ACT (IDAPA)
Department of Administration
999 Main Street, Suite 910
Boise, ID 83702
Ph: 208-332-0102
Fax: 208-332-0106
E-mail: rulescoordinator@adm.idaho.gov
Internet: <http://adminrules.idaho.gov>

TRUCK MIXER MANUFACTURERS BUREAU (TMMB)
Truck Mixer Manufacturers Bureau
900 Spring Street

Silver Spring, MD 20910
Ph: 301-587-1400
Fax: 301-587-1605
Internet: <http://www.tmmmb.org>

U.S. COMPOSTING COUNCIL (USCC)
5400 Grosvenor Lane
Bethesda, MD 20814
Ph: 301-897-2715
Fax: 301-530-5072
Internet: <http://compostingcouncil.org>

U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8871
Fax: 704-852-4189
E-mail: seed.ams@usda.gov
Internet: <URL <http://www.ams.usda.gov/lsg/seed.htm>>
Order Other Publications from:
U.S. Department of Agriculture, Rural Utilities Service
14th and Independence Avenue, SW, Room 4028-S
Washington, DC 20250
Ph: 202-720-2791
Fax: 202-720-2166
Internet: <http://www.usda.gov/rus>

U.S. DEPARTMENT OF DEFENSE (DOD)
Order DOD Documents from:
Room 3A750-The Pentagon
1400 Defense Pentagon
Washington, DC 20301-1400
Ph: 703-571-3343
FAX: 215-697-1462
E-mail: pia@hq.afis.asd.mil
Internet: <http://www.dod.gov>
Obtain Military Specifications, Standards and Related Publications
from:
Acquisition Streamlining and Standardization Information System
(ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: <http://assist.daps.dla.mil/online/start>; account
registration required
Obtain Unified Facilities Criteria (UFC) from:
Whole Building Design Guide (WBDG)
National Institute of Building Sciences (NIBS)
1090 Vermont Avenue NW, Suite 700
Washington, DC 20005

Ph: 202-289-7800
Fax: 202-289-1092
Internet: http://www.wbdg.org/references/docs_refs.php

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-272-0167
for Fax and E-mail see below
Internet: <http://www.epa.gov>
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6050 or 1-688-584-8332
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: <http://www.ntis.gov>

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
FHWA, Office of Safety
1200 New Jersey Ave., SE
Washington, DC 20590-
Ph: 202-366-0411
Fax: 202-366-2249
E-mail: contactcenter@gpo.gov
Internet: <http://www.safety.fhwa.dot.gov>
Order from:
Superintendent of Documents
U. S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: <URL <http://www.gpoaccess.gov>

U.S. GENERAL SERVICES ADMINISTRATION (GSA)
General Services Administration
1800 F Street, NW
Washington, DC 20405
Ph: 202-501-0800
Internet: www.GSA.gov
Obtain documents from:
Acquisition Streamlining and Standardization Information System
(ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: <URL <http://assist.daps.dla.mil/online/start/>; account
registration required

U.S. GEOLOGIC SURVEY (USGS)
12201 Sunrise Valley Drive
Reston, VA 20192, USA
Ph: 703-648-5953
Internet: <http://www.usgs.gov/>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
E-mail: contactcenter@gpo.gov
Internet: <http://www.archives.gov>

Order documents from:
Superintendent of Documents
U.S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: <http://www.gpoaccess.gov>

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

SECTION 01450

IMPORT MATERIAL CERTIFICATION

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 General

This section identifies environmental data quality management requirements for sampling and analysis associated with construction materials (imported materials, salvaged soil, riprap, and gravel) and Contractor quality control sampling, associated laboratory quality control, and the site-specific quality assurance project plan for this Contract. This section delineates the responsibilities and procedures for all Contractor sampling and analytical activities to ensure that the data obtained is of sufficient quality to meet intended uses. Trust-designated borrow sources may be provided for use by the Contractor. In these cases, the testing requirements of this section shall apply unless otherwise specified.

1.1.2 Use of Laboratory Results

Turnaround time (TAT) for laboratory results must allow the Contractor to make determinations regarding the suitability of material prior to utilization as borrow or surfacing material. If the Contractor chooses to make suitability decisions based on preliminary data, all costs associated with replacing material later found to be unsuitable will be the responsibility of the Contractor.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred within the text by the basic designation only.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

U.S. EPA SW-846 (Third Edition; Update IV) Test Methods
for Evaluating Solid Waste:
Physical/Chemical Methods

DEPARTMENT OF ECOLOGY - STATE OF WASHINGTON (DE-WA)

NWTPH-HCID Northwest Total Petroleum Hydrocarbon
Analytical Method - Hydrocarbon

1.3 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Memo Adopting the Trust Furnished Quality Assurance Project Plan; T

A QAPP shall be provided by the Trust. The Contractor shall adopt and implement the QAPP for the collection and analysis of all environmental samples.

Laboratory Accreditation and Approval; T

The materials testing laboratory shall be approved by the Trust Representative for all tests required by contract.

Analytical chemistry laboratories shall be required to maintain current National Environmental Laboratory Accreditation Program (NELAP) for all appropriate analytical chemistry tests required by this contract.

SD-03 Product Data

Qualifications; T

Name and qualifications of the Quality Assurance Officer and Environmental Sampler within 30 calendar days after the Notice to Proceed (NTP).

SD-06 Test Reports

Analytical Data Packages; T

Analytical Data Packages shall be provided to the Trust's Representative within one working day from when the test results are available from the laboratory. The Analytical Data Packages shall be labeled with the applicable sampling dates, contract number, field sample IDs, borrow source(s), project name and locations. A statement of data verification and usability shall be provided by the Contractor as an attachment to the Analytical Data Package.

SD-07 Certificates

Imported Material Source Certification; T

A letter certifying compliance with paragraph "Imported Material Source Certification" shall be provided to the Trust Representative for each material source prior to placement on site.

1.4 CHEMISTRY REQUIREMENTS

The work to be completed through this contract will be performed in accordance with the QAPP and will include chemical testing of all imported materials.

1.4.1 Project Quality Objectives (PQOs)

The project objectives for sampling and analysis are identified in the QAPP to ensure that imported materials do not contain heavy metals at concentrations greater than the requirements listed below.

1.4.2 Project Sampling and Analysis

Sampling and analysis of project materials shall be conducted in accordance with the memorandum adopting the Trust-Furnished QAPP. The Contractor shall be responsible to certify material sources prior to use and shall furnish analytical data packages for all material sampling performed for the work. Analytical methods selected for the work must be capable of supporting the PQOs.

1.5 CONTRACTOR QUALITY ASSURANCE ELEMENTS

The Contractor shall be responsible for the following quality assurance elements necessary to monitor and ensure the quality of chemical data produced.

1.5.1 Laboratory Accreditation and Approval Requirements

For work performed under this Contract, environmental laboratory services are to be provided only by laboratories holding a current NELAP accreditation for all appropriate fields of testing. Before performing environmental testing, the laboratory shall have access to the approved Quality Assurance Project Plan (QAPP) provided by the Trust.

1.5.2 Data Verification and Review

The Contractor shall be responsible for verification and review of 100 percent of laboratory results. Data verification is a completeness check that is performed before the data review process continues in order to determine whether the required information (the complete data package) is available for further review. Data review is described in the QAPP and includes evaluation of laboratory quality control results and field quality assurance samples (see Table 2) and application of data usability qualifiers as appropriate. This applies to hard copy and electronic deliverables.

1.5.2 Data Validation

All imported material must be validated, according to the provision of the QAPP, prior to import to the project site. The Trust Representative will perform data validation for all analytical sampling performed for the project. The validation process will confirm by examination and provision of objective evidence that the particular requirements for the specific intended use have been fulfilled. Upon receipt of the Analytical Data Packages submitted by the Contractor the Trust Representative will validate the data and provide notice to the Contractor that the data is acceptable within one working day.

1.6 QUALIFICATIONS

1.6.1 Quality Assurance Officer

As a minimum, the Contractor's Quality Assurance Officer shall have 3 years of experience related to investigations, studies, design, and remedial actions at cleanup sites. The Quality Assurance Officer shall ensure that all chemistry-related objectives including responsibilities for PQOs, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. The Quality Assurance

officer need not be present on-site during routine sampling, but shall be available for consultation with Trust and Contractor personnel.

1.6.2 Environmental Sampler

The Environmental Sampler shall collect all samples to assess chemical suitability of construction materials. The Environmental Sampler shall review the sampling results and provide recommendations for the Contractor's sampling program. As a minimum, the Contractor's Environmental Sampler shall have graduated from the Superfund Job Training Initiative, or similar training, or shall have 2 years of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples.

1.7 COORDINATION MEETING

After the pre-construction conference, before any sampling or testing, the Contractor and the Trust Representative will meet at the construction site to discuss the Contractor-furnished memorandum adopting the Trust-furnished QAPP. The coordination meeting will be simultaneous to any CQC coordination meeting required in Section 01451 CONTRACTOR QUALITY CONTROL unless otherwise indicated or directed. A list of definable features that involve chemical measurements shall be confirmed. Management of the chemical data quality system including PQOs, project submittals, chemical data documentation, chemical data assessment, required sampling and analysis protocols, and minimum data reporting requirements shall be confirmed. The meeting will establish an interrelationship between the Contractor's chemical data quality management and Trust's chemical quality assurance requirements in accordance with the QAPP. The Contractor's Quality Assurance Officer shall be present at this meeting unless otherwise approved by the Trust Representative. Minutes of the meeting will be documented by the Trust.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor shall be responsible for implementation of the Trust-provided QAPP including the collection of samples for chemical analysis, sample analysis, and for chemical data quality control (QC). An effective chemical data quality control system shall be established that meets the requirements for the analytical measurements applicable to the project. The system shall cover analyses measurements pertaining to and required for Contractor- and subcontractor-produced analytical data. All requirements from analytical methods specified in the QAPP will be adhered to. The Contractor shall control sampling and testing in conjunction with remedial activities to meet all PQOs and ensure completion of work within the required time.

3.2 MEMORANDUM ADOPTING THE TRUST-FURNISHED QUALITY ASSURANCE PROJECT PLAN

The memorandum shall confirm the Contractor's understanding of the Trust-furnished QAPP requirements for chemical data quality control, and shall describe procedures for field sampling (i.e., location of samples, etc.) and sample submittal for analysis, field chemical parameter

measurement, data documentation, data assessment, and data reporting requirements with reference, as necessary, to the Trust-furnished QAPP. Specifically, the memorandum shall serve several purposes:

- a. As a technical planning document, it identifies and outlines how the sampling, analytical, and quality assurance/quality control (QA/QC) activities will be implemented in accordance with the Trust-furnished QAPP, particularly to support material suitability decisions.
- b. As an organizational document, it identifies key project personnel, thereby facilitating communication. As a single interrelated document, the memorandum shall be provided to field and laboratory personnel. The memorandum shall clearly identify the Contractor-obtained laboratories.
- c. As an assessment and oversight document, it provides the criteria for assessment of project implementation and for QA and contractor oversight. The memorandum shall delineate the methods the Contractor intends to use to accomplish the chemical quality control items to assure accurate, precise, representative, complete, legally defensible, and comparable data.

3.3 SAMPLING, ANALYSIS, AND MEASUREMENT

Sampling, analysis, and measurement shall be conducted in accordance with the memorandum adopting the Trust-Furnished QAPP. The following sections describe the sampling frequency and general procedures for each sample type and matrix. Action levels for importing construction materials are shown in Table 1 while required sampling frequencies and analytical methods are shown in Table 2.

3.3.1 Imported Material Source Certification

Prior to any material import to the project, the Contractor shall submit a source certification for each intended material source, and the data associated with the certification must be validated by the Trust Representative in accordance with Paragraph "Data Validation." The Contractor shall supply a letter certifying that each imported material type does not contain any compounds hazardous to human health or the environment.

Sampling shall be performed in accordance with this section and shall include all analytes listed in Table 1. Each intended import material source must comply with the action levels indicated in Table 1:

Table 1. Action Levels for Imported Construction Materials

Total Metals
Lead (Pb)< 100 parts per million (ppm) average; no single 150 ppm exceedance
Arsenic (As)< 35 ppm average; no single 45 ppm exceedance
Cadmium (Cd)< 5.0 ppm; no single exceedance of 5.0 ppm
Zinc (Zn)< 100 ppm average; no single 280 ppm exceedance

Materials shall not contain metals and/or other toxics (including petroleum) at concentrations that exceed applicable standards or are otherwise regulated as waste. It is the Contractor's responsibility to ensure that these requirements are met and that the Trust's Representative is provided with a profile of the material prior to placement on site. The profile will

be obtained from a sample representative of the material in accordance with the QAPP.

The sample will be analyzed for the constituents listed in Table 1 by the methods provided in Table 2. This information shall be delivered to the Trust's Representative as part of the material certification and the data must be validated in accordance with paragraph "Data Validation" prior to use of the material. Material found to have concentrations exceeding the maximum concentrations listed in Table 1 may be rejected. The Trust Representative may further evaluate marginal exceedances of criteria for conditional acceptance. If materials are placed that do not meet clean material criteria, they will be removed at the Contractor's expense and with no adjustment to contract days or the project schedule. Changes in the material source or use of multiple sources require a separate letter of certification for each source.

Table 2. Sampling and Analysis Requirements

Matrix	Frequency	Analytes	Method
Primary Samples	1/300 tons or 1/200 CY	Pb, As, Cd, Zn	Total Metals via USEPA SW-846 Method 6010
Quality Assurance Samples	1/20 primary samples	Pb, As, Cd, Zn	Total Metals via USEPA SW-846 Method 6010

3.3.2 Ongoing Sampling and Analysis for Imported Materials

In addition to the initial sampling required for certification, additional samples shall be collected by the Contractor at the rate of one composite sample for each 300 tons (or 200 cubic yards) of imported materials to confirm ongoing compliance with the criteria in Table 1. The sampling frequency applies to each imported material type and to any change in material source. The sample will be analyzed for the constituents listed in Table 1 by the methods provided in Table 2. Additional requirements may be specified in the site-specific QAPP provided by the Trust.

The Analytical Data Packages for the ongoing sampling and analysis shall be delivered to the Trust's Representative and the data must be validated in accordance with paragraph "Data Validation" prior to use of the material. Material found to have concentrations exceeding the maximum concentrations listed in Table 1 may be rejected. The Trust Representative may further evaluate marginal exceedances of criteria for conditional acceptance. If materials are placed that do not meet clean material criteria, they will be removed at the Contractor's expense and with no adjustment to contract days or the project schedule.

3.4 ANALYTICAL DATA PACKAGES

The following sections describe the requirements for analytical data packages. The format for the data packages shall include the following:

- a. The analytical reports shall be labeled with the applicable sampling dates, contract number, field sample IDs, borrow source(s), project name and locations.
- b. The "Cooler Receipt Form" shall be completed by the Contract Laboratory documenting sample conditions on arrival at the laboratory. Original copies of cooler receipt forms as well as original copies of chain of custody forms shall be provided with certificates of analysis.
- b. For each analytical method, the Contract Laboratory shall report all analytes as a detected concentration or as less than the practical quantitation limit (PQL). Samples associated with QC exceedances due to matrix interference will be designated as such. All soil samples will be reported on a dry weight basis with the percent moisture reported for each sample. Dilution factors, date of extraction, date of analysis, and practical quantitation limits shall be reported for each analyte and method.
- c. Reports of method blanks shall include all analytes for each analytical method. Analytical results for each sample shall be clearly associated with a particular method blank. Any detected concentration found in method blanks shall be reported. Reports of concentrations below the PQL are necessary to evaluate low level determinations of target compounds in samples. Any method blank detection above the PQL shall be reported and any associated sample result will be qualified.
- d. Surrogate spike recoveries shall be reported for all applicable methods. The report shall also specify the control limits for surrogate recoveries. Any recovery exceedances shall result in the sample being rerun once. If subsequent analyses result in exceedances, both results shall be reported with the appropriate qualifiers assigned.
- e. Matrix spike and matrix spike duplicate (MS/MSD) recoveries shall be reported for all applicable methods. All sample results shall be designated as corresponding to a particular set of MS/MSD analyses. MS/MSD analyses not meeting quality control criteria specified in the QAPP shall be rerun once. If subsequent analyses result in exceedances both results shall be reported with the appropriate qualifiers assigned. The report shall also specify control limits for spike recoveries and relative percent difference (RPD).
- f. Results for laboratory duplicates shall be reported with RPD control limits.
- g. The Contract Laboratory shall prepare a summary of all MS/MSD analyses for each applicable method indicating acceptable recovery limits and QC acceptance criteria for RPD.
- h. The Contract Laboratory shall prepare a summary of all laboratory duplicates with QC acceptance criteria for RPD clearly indicated.

- i. The data package shall contain a narrative section identifying samples not meeting QC criteria and any other out of control condition. The narrative shall describe the corrective action taken. If "matrix interferences" are invoked as a cause for exceeding recoveries, a subsection of the narrative shall present a detailed justification of the invocation.

The Contractor shall furnish analytical data packages to the Trust Representative within one working day from when test results are available from the laboratory. A statement of data verification and usability shall be provided by the Contractor as an attachment to the analytical data packages.

3.5 CONTROL OF CHEMICAL DATA QUALITY

The Contractor shall ensure that a QC program is in place than ensures sampling and analytical activities and the resulting analytical data complies with the PQOs and the requirements of the QAPP.

3.6 NOTIFICATION OF NON-COMPLIANCE

The Trust Representative will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice.

-- End of Section --

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment, and incidentals required to prepare and update a quality control system to produce an end product which complies with the contract requirements

1.2 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Quality Control Plan; T

The Contractor shall furnish for review by the Trust, not later than 30 days after contract award, the Contractor Quality Control (CQC) Plan for the overall contract, hereinafter referred to as the "General CQC Plan" proposed to implement the requirements of the Contract Article 13 (Tests and Inspection; Correction, Removal or Acceptance of Defective Work). The plan shall identify personnel, procedures, controls, instructions, tests, records, and forms to be used. The Trust will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

Material Testing Laboratory Qualifications; T

The materials testing laboratory must be approved by the Trust Representative for all tests required by contract.

SD-06 Test Reports

Daily Contractor Quality Control reports;

The CQC records shall be furnished, in report form, to the Trust Representative daily within one working day after the date(s) covered by the report. At a minimum, one report shall be prepared and submitted each week. All calendar days shall be accounted for throughout the life of the contract. Contractor's submitted QC records shall conform to paragraph "DOCUMENTATION."

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Trust Representative for non-compliance with quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Trust Representative, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the features for all aspects of the work specified. The staff shall include a CQC Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC Manager, including authority to stop work that is not in compliance with the contract. The CQC Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Trust.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Trust Representative shall be used.)

- f. Procedures for tracking preparatory, initial, and follow-up control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Trust reserves the right to require the Contractor to make changes in its CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Trust Representative in writing of any proposed change. Proposed changes are subject to acceptance by the Trust Representative.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Trust of the CQC Plan, the Contractor shall meet with the Trust Representative and discuss the Contractor's quality control plan. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's Management and control with the Trust's Quality Assurance. Minutes of the meeting will be prepared by the Trust Representative and signed by both the Contractor and the Trust Representative. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC Manager and sufficient number of additional qualified personnel to ensure safety and contract

compliance. The Safety and Health manager shall receive direction and authority from the CQC Manager and shall serve as a member of the CQC staff. The Contractor shall provide a CQC organization that shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Trust Representative. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawings submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Trust Representative.

3.4.2 CQC Manager

The Contractor shall identify as CQC Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. This CQC Manager shall be available to visit the site at times during construction to verify compliance and will be employed by the Contractor, except as noted in the following. An alternate for the CQC Manager will be identified in the plan to serve in the event of the system manager's absence. Period of absence may not exceed 3 weeks at any one time. The requirements for the alternate will be the same as for the designated CQC manager.

The CQC Manager shall be an experienced construction person with a minimum of 3 years experience in related work such as investigations, studies, design, and remedial actions at cleanup sites. The CQC Manager may be assigned other duties such as project superintendent, project manager, and or safety officer in addition to quality control.

3.4.3 Organizational Changes

The Contractor shall obtain Trust Representative's acceptance before replacing any member of the CQC staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

3.5 SUBMITTALS AND DELIVERABLES

Submittals shall be as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements. The Contractor may use standard report forms for submittal of any required data subject to the approval of the Trust Representative.

3.6 QUALITY CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the work performed, to include that of subcontractors and suppliers, complies with the requirements of the contract. The controls shall be adequate to cover all operations, including analytical chemistry and both on-site and off-site fabrication. Such controls will be keyed to the proposed construction sequence.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Individual specification sections may also require additional testing. Contractor shall submit all materials test reports on forms standard to industry standards such as ACI, ASTM and AASHTO. Upon request, the Contractor shall furnish to the Trust duplicate samples of test specimens for possible testing by the Trust. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of an material testing laboratory in advance of any and all required testing; and in addition, submit [laboratory qualifications](#) for Trust approval. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If final test results are not available, Contractor shall provide the Trust Representative with preliminary results, or at a minimum, a list of tests completed with a reference to the test number and date taken, until actual test reports may be submitted. An information copy of tests performed by any off-site or commercial test facility shall be provided directly to the Trust Representative. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Materials Testing Laboratories

Contractor shall provide services of an independent materials testing laboratory for tests per Division 2 SITE WORK. Provide qualified personnel to perform specified inspection, sampling and testing of materials and methods of construction; comply with specified standards. Maintain and calibrate testing equipment in accordance with the specified test methods and laboratory quality control procedures; calibration records shall be available for Trust inspection upon request. Employment of a testing laboratory shall in no way relieve the Contractor from obligations to perform work in accordance with the Contract. Submit written reports and test results within 7 calendar days of receipt by Contractor.

3.7.3 On-Site Laboratory

The Trust reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Trust.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor.

3.8 COMPLETION INSPECTION

The following provides a summary of the inspection work required at the completion of the project:

- a. Punch list: At the completion of all work or any increment thereof, the CQC Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved plans and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph 3.9 DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected and notify the Trust. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates. Once this is accomplished, the Contractor shall notify the Trust that the facility is ready for the Pre-Final Inspection.
- b. Pre-Final Inspection: The Trust, CQC Manager and Trust Representative(s) will perform this inspection to verify that the feature is complete and ready to be occupied. The CQC Manager or staff shall ensure that all items on this list have been corrected before notifying the Trust so that a Final Inspection with the Trust can be scheduled. Any items noted on the Pre-Final Inspection shall be corrected in a timely manner.
- c. Final Acceptance Inspection: The Trust, CQC Manager and the Trust Representative(s) shall be in attendance. The Final Acceptance Inspection will be formally scheduled by the Trust Representative at least 7 calendar days prior to the Final Acceptance Inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the Final Acceptance Inspection.

3.9 DOCUMENTATION

The Contractor shall maintain current records of quality control operations, activities, and tests performed, including the work of subcontractors and suppliers. These records shall be on an acceptable form and shall be a complete description of inspections, the results of inspections, daily activities, tests, and other items, including but not limited to the following:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom.
- d. Test and/or control activities performed with results and references to specifications/plan requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Preliminary test and/or control activities with preliminary results and references to locations/specifications/plan requirements if final results are not available for inclusion at the time of daily QC documentation.
- f. Material received with statement as to its acceptability and storage.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. List instructions given/received and conflicts in plans and/or specifications.
- j. A description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features.
- k. Contractor's statement that workmanship and the equipment and materials incorporated in the work comply with the contract.

These CQC records, in report form, shall be furnished to the Trust daily within one working day after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed.

At a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC Manager. The report from the CQC Manager shall include preliminary testing locations and results, copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 NOTIFICATION OF NONCOMPLIANCE

The Trust Representative will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor at the site of the work, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Trust Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made

the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

SECTION 01501

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall provide all the temporary construction support facilities required to execute this Contract and comply, at minimum, with the requirements specified herein. All structures installed under this section shall be removed at the completion of the project. Facilities shall be located as approved by the Trust Representative. Office equipment and furnishings identified in this specification shall become property of the Contractor after completion of the project unless otherwise specified.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70

(2011) National Electrical Code - 2011
Edition

1.3 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; T

Prior to the start of work, submit a site plan showing the locations and dimensions of temporary facilities (including layouts and details), equipment and material storage area (onsite and offsite), and access and haul routes. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4 AVAILABILITY OF UTILITY SERVICES

The Contractor shall be responsible for providing its own utilities services for all activities.

1.4.1 Sanitary Provisions

Contractor shall provide sanitary accommodations for the use by employees, visitors, and Trust personnel for the duration of site work as may be necessary and shall maintain accommodations approved by the Trust Representative and shall comply with the requirements and regulations of the

State Health Department, County Sanitarian, or other authorities having jurisdiction. Facilities shall have hand washing/sanitizing capabilities and supplies.

1.4.2 Potable Water

Contractor shall provide adequate supplies from off-site potable water sources at their own expense for use by employees, visitors, and Trust personnel for the duration of site work. It is the Contractor's responsibility to identify and procure the water.

1.4.3 Telephone/Site Communication

- a. When Contractor has elements of work where cellular telephone coverage is poor, the contractor shall provide additional means for site communication.
- b. Whenever the Contractor has the individual elements of its work located that operation by normal voice between these elements is not satisfactory, the Contractor shall provide satisfactory means of communication, such as two-way radio or other suitable devices.

1.5 TEMPORARY ELECTRIC WIRING

1.5.1 Temporary Power and Lighting

The Contractor shall provide construction power facilities in accordance with the safety requirements of the National Electric Code [NFPA 70](#). The Contractor, or its delegated subcontractor, shall enforce the safety requirements of electrical extensions for the work of subcontractors. Work shall be accomplished by skilled electrical tradesmen.

1.5.2 Construction Equipment

Temporary wiring conductors installed for operation of construction tools and equipment shall be either Type TW or THW contained in metal raceways, or shall be hard usage or extra hard usage multiconductor cord. Temporary wiring shall be secured above the ground or floor in a workmanlike manner and shall not present an obstacle to persons or equipment. Open wiring may only be used outside of buildings, and then only in accordance with the provisions of the National Electric Code.

1.5.3 Submittals

Submit detailed drawings of temporary power connections, if utilized, for the specific tasks requiring the associated work. Drawings shall include, but not be limited to, main disconnect, grounding, service drops, service entrance conductors, feeders, Ground Fault Circuit Interrupter (GFCIs). Also submit Contractor's site trailer connections for any temporary facilities.

1.6 FIRE PROTECTION

During the construction period, the Contractor shall provide fire extinguishers and other required equipment. The Contractor shall remove the fire extinguishers and equipment at the completion of construction.

1.7 STAGING/STORAGE AREA

Access into all secure areas and establishment of the Contractor's staging and designated work areas shall be coordinated through the Trust Representative. The Contractor shall be responsible to secure his own work site area.

1.8 HOUSEKEEPING AND CLEANUP

The Contractor shall submit a detailed written plan for implementation of this requirement. The plan will be presented as part of the preconstruction safety plan and will provide for keeping the total construction site, structures, and accessways free of debris and obstructions at all times. Work will not be allowed in those areas that, in the opinion of the Trust Representative, have unsatisfactory cleanup and housekeeping at the end of the preceding day's normal work shift. At least once each day all areas shall be checked by the Contractor and the findings recorded on the Quality Control Daily Report in accordance with Section 01451 CONTRACTOR QUALITY CONTROL. In addition, the Quality Control person shall take immediate action to insure compliance with this requirement. Housekeeping and cleanup shall be assigned by the Contractor to specific personnel. The name(s) of the personnel shall be available at the project site.

1.9 UTILITY CLEARANCE

Before performing any onsite excavation, the Contractor shall be responsible for locating all utilities on site. Copies of clearance tickets shall be provided to the Trust Representative. Utility lines shall be marked in the field prior to excavation. The locations of any utilities obtained from the clearances shall be verified on or added to the as-built drawings.

1.10 TRAFFIC CONTROL

The Contractor shall provide for movement of traffic through and around each construction zone in a manner that is conducive to the safety of workers. This shall include placement and maintenance of traffic control devices in accordance with the U.S. Department of Transportation, Federal Highway Administration publication, Manual on Uniform Traffic Control Devices. Traffic control on all roads shall be coordinated with the appropriate local government agencies with a copy of all requests and approved plans to the Trust Representative at least 5 working days prior to work. The Contractor shall provide a Traffic Control Plan in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

1.11 DUST CONTROL

Dust control shall be conducted in accordance with the environmental protection plan described in Section 01355 ENVIRONMENTAL PROTECTION, and in accordance with Section 01800 ROAD MAINTENANCE AND DUST CONTROL.

1.12 CLEARING AND GRUBBING

Clearing and grubbing for access and road improvement shall be in accordance with Section 02231 CLEARING AND GRUBBING.

1.13 PROJECT AND SAFETY SIGNS

The Contractor shall furnish and install project identification sign(s) and one safety performance sign in accordance with conditions hereinafter specified and layout as indicated on the Construction Drawings.

1.13.1 Project Sign

The project sign shall include the name of the project, the logo and name of the Trust, all involved agencies, design companies, and the Contractor.

1.13.2 Safety Performance Signs

All safety performance sign lettering shall be painted black on white background. Letters shall be painted as indicated using exterior-type paint. The signs shall be maintained in excellent condition for the duration of the project. The signs shall be located as directed by the Trust Representative. The data required by the safety sign shall be corrected daily, with light colored metallic or nonmetallic numerals. The signs shall be erected within 15 calendar days after receipt of the Notice to Proceed (NTP). Upon completion of project, the signs shall be removed and shall remain the property of Contractor.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

-- End of Section --

SECTION 01720

FIELD SURVEYING

PART 1 GENERAL

1.1 SCOPE OF WORK

- a. The Contractor shall provide all materials, items, operations, or methods specified, listed, or scheduled on the Construction Drawings or in the Technical Specifications, including all materials, labor, equipment, and incidentals necessary and required to conduct proper surveys required to stake and layout the Work.
- b. The Contractor shall perform progress quantity surveys to verify the quantities of "as-built" construction for payment of completed work.
- c. Contractor will develop all detailed surveys needed for the Work. The Trust will provide all primary control and establish control coordinates, as shown on the Construction Drawings, for the Work with necessary benchmarks adjacent to the Work. Trust will provide all horizontal and vertical controls on the Construction Drawings. Contractor shall be responsible for setting any supplementary stakes necessary to control its Work and meet the accuracy requirements of the Contract documents. Contractor shall perform its Work by reference and control provided. Contractor shall maintain in place all primary and other control coordinate stakes, and benchmarks. Control stakes carelessly or willfully destroyed or disturbed by Contractor will be reset by Contractor at the Contractor's expense. Control points located within areas that must be disturbed can be removed without replacement at Trust Representative's discretion. Contractor shall notify Trust Representative of any required survey at least 48 hours before starting Work.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE OF IDAHO ADMINISTRATIVE CODE (IC)

I.C. § 55-16

Title 55 Property in General, Chapter 16
Corner Perpetuation and Filing

STATE OF IDAHO ADMINISTRATIVE PROCEDURES ACT (IDAPA)

IDAPA 10.01.03

Rules for Corner Perpetuation and Filing

1.3 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-06 Test Reports

Field Notes, Computations, and Survey Information

Upon completion of the fieldwork, the Contractor shall furnish the Trust Representative copies of all field notes, computations, any records relating to the survey information or to the layout of the Work. The Contractor is responsible for converting data and drawing files using CAD software and in a format approved by the Trust Representative.

SD-07 Certificates

Survey Crew Qualifications; T

Prior to start of any survey work, the Contractor shall submit name, address, telephone number, and qualifications of the surveyor, crew chief, superintendent, and all other persons who are proposed to perform surveys or survey-related duties to the Trust Representative for review and acceptance. All survey work shall be performed by a qualified, independent third party, Professional Land Surveyor (PLS) registered in Idaho.

SD-11 Closeout Submittals

Record Survey;

Within 30 days of reaching substantial completion, the Contractor shall furnish a Record Survey documenting changes in the location, size, shape and quantity of all physical features of the work to the Trust Representative. The Contractor is responsible for converting all data and drawing files and shall furnish the Record Survey in AutoCAD format unless otherwise approved by the Trust Representative.

1.4 PROJECT RECORD DOCUMENTS

- a. The Contractor shall maintain on site a complete, accurate log of control of survey work as it progresses.
- b. Upon completion of the Work, the Contractor shall prepare and submit to the Trust Representative a Record Survey and Record Drawings under the provisions of Section 01781 AS BUILT RECORDS AND DRAWINGS and Section 01782 CLOSEOUT SUBMITTALS.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 GENERAL

Perform all quantity surveys for unit price items as set forth in the Measurement and Payment provisions. Perform all quantity calculations using methods described in Measurement and Payment provisions. Copies of the survey notes and calculations will be supplied to Trust upon request. The Trust will note any discrepancies between Contractor's calculation and Trust's calculation and notify the Contractor of such discrepancies within 10 days of receipt of notes and calculations. Discrepancies will be resolved

between the parties. If Trust and Contractor cannot agree on actual quantities, the parties shall follow the procedures for resolving disputes in Article 16 of the General Conditions.

3.2 SURVEY WORK

The Contractor shall exercise care during the execution of the Work to minimize any disturbance to existing property and to the landscape in the areas surrounding the work site, and to ensure survey crews limit their work to within the project site boundaries as defined on the Construction Drawings. Surveys by the Contractor shall include, but not be limited to, the following:

- a. Initial inspection.
- b. Survey to establish new benchmarks, if necessary.
- c. Any surveys to reestablish destroyed or damaged control points.
- d. Any other surveys indicated or implied by these specifications or necessary to document pre-excavation grades and final grades for the payment of quantities. The Contractor shall comply with all requests by the Trust Representative for additional surveys deemed necessary to verify that conditions of the Contract are met. Any surveys necessary to correct defects in the work shall be performed by the Contractor at no additional cost to the Trust.

3.3 SURVEY REFERENCE POINTS AND PROPERTY CORNERS

- a. The Contractor shall identify and protect existing survey control points prior to starting site work and preserve permanent control points during construction. The Contractor shall not relocate site control points without prior written approval from the Trust Representative.
- b. The Contractor shall promptly report to the Trust Representative the loss, damage, destruction, or relocation of any other control points or property corners required because of changes in grades or other reasons. Survey accuracy used to relocate disturbed control points shall be equal to or better than that with which the original control was set. At a minimum, control points shall be reset to within the tolerance described in Paragraph SURVEY REQUIREMENTS. Permanent reference points shall be constructed to meet the applicable requirements of Idaho State Code including but not limited to Title 54, Chapter 12 (Engineers and Surveyors) and property corners shall be reestablished to meet the applicable requirements of I.C. § 55-16; and IDAPA 10.01.03.

3.4 INSPECTION AND INITIAL SURVEY

The Contractor shall verify existing site conditions, including but not limited to locations and horizontal and vertical coordinates of existing bench marks, survey control points, utilities, topography, and site features, prior to starting work. The Contractor shall promptly notify the Trust Representative of any discrepancies discovered. The Contractor shall also verify layouts periodically during construction. The Contractor shall perform a damage inspection prior to the start of work activities at the Site. The inspection shall include all structures and identified aboveground

utilities. The inspection shall include the limits of site work. The damage inspection results shall be compared to the site conditions indicated on the Construction Drawings. Any discrepancies in existing site conditions, damage to existing facilities or missing items shall be noted in writing and provided to the Trust Representative prior to the start of site work.

3.5 SURVEY REQUIREMENTS

- a. The Contractor shall reference Trust-established site reference points and survey control points to the provided permanent benchmarks, with horizontal and vertical data, on As-Built Drawings.
- b. All control surveys for elevation shall be ± 0.01 foot and, for horizontal, control angles shall be to the nearest twenty (20) seconds ± 10 seconds, and measured distances shall be to ± 0.01 foot. All measurement surveys for elevation shall be to the nearest 0.01 foot and for horizontal distances shall be to ± 0.01 foot for monuments and 0.1 foot for ground shots.
- c. The Contractor shall provide all materials as required to properly perform the construction surveys, including, but not limited to, instruments, tapes, rods, measures, mounts and tripods, stakes and hubs, nails, ribbons, other reference markers, and all else as required. All material shall be of good professional quality and condition.
- d. All lasers, transits, and other instruments shall be calibrated and maintained in accurate calibration throughout the execution of the Work.
- e. The Contractor shall furnish all materials and accessories (i.e., grade markers, stakes, pins, spikes, etc.) required for the proper location of grade points and line.
- f. All marks given shall be carefully preserved and, if destroyed or removed without the Trust Representative's approval, shall be reset, if necessary, at the Contractor's expense.

3.5 PROGRESS SURVEYS

A marked-up set of Project survey records shall be kept updated as construction progresses in coordination with Section 01781 AS BUILT RECORDS AND DRAWINGS. The Contractor shall furnish all surveys for quantity measurement and payment purposes during the course of the work. The Trust Representative will use them to verify the amount of progress payments. The Contractor shall retain copies of all such material furnished to the Trust Representative.

3.6 FINAL SURVEY RECORDS

Upon completion of all fieldwork, the Contractor shall perform a Record Survey, certified by a PLS registered in Idaho, recorded in the State Plane Coordinate System, Idaho West Zone, using the North American Datum (NAD 1983) and the North American Vertical Datum of 1988. The Contractor shall furnish both AutoCAD compatible drawings and a stamped hardcopy for incorporation into the final as-built drawings per Section 01781 AS BUILT RECORDS AND DRAWINGS and to provide final Record Field Data to the Trust

Representative under the provisions of Section 01782 CLOSEOUT SUBMITTALS. The Contractor shall furnish the Trust Representative originals of all field notes, computations, and survey information or layout of the work. The final survey and records shall be provided to the Trust Representative no later than 30 calendar days after substantial completion.

-- End of Section --

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SECTION 01781

AS BUILT RECORDS AND DRAWINGS

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall maintain and submit as-built record documents. All such record documents shall conform to the applicable requirements for this section.

1.2 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-11 Closeout Submittals

As-Built Drawings; T

Two complete sets of the As-Built Drawings shall be submitted to the Trust Representative for review and approval a maximum of 30 calendar days after substantial completion. If review of the preliminary as-built drawings reveals errors and/or omissions, one set of marked drawings will be returned to the Contractor for the completion of the final as-built drawings. The Contractor shall make all corrections and return the drawings to the Trust Representative for review and approval within 10 calendar days of receipt.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

The Contractor shall keep at the construction site field office two complete sets of the prints of the Construction Drawings, reproduced at Contractor expense, one for the Contractor's use, one for the Trust. During construction, both sets of prints shall be marked to show the as-built conditions during the duration of the project. Changes from the Construction Drawings which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The color red shall be used to indicate all additions and green to indicate all deletions. The drawings shall show the following information but not be limited thereto:

- a. Correct grade, elevations, cross section, or alignment of roads, or earthwork if any changes were made from Construction Drawings.
- b. Correct location of all existing site features, including buildings, trees and stumps to remain, fence lines, if different from original Construction Drawings.

- c. Locations of any replacement plantings of trees or other landscape features.
- d. The topography and grades of all drainage affected or altered as part of the project construction.
- e. Changes or modifications which result from the final inspection.
- f. Where Construction Drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.
- g. If borrow material for this project is from sources on Trust property, or if Trust property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.
- h. Features designed or enhanced by the Contractor.
- i. Miscellaneous changes or modifications from the original design and layout of work.

Deviations shall be shown in the same general detail utilized in the Construction Drawings. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Additional drawing sheet(s) shall be provided as required to explain all work performed and shall be in the same format and detail utilized in the Construction Drawings. The resulting field-marked prints and data shall be referred to and marked as "As-Built Drawings," and shall be used for no other purpose. They shall be made available for inspection by the Trust or its Representatives whenever requested during construction and shall be jointly inspected for accuracy and completeness by the Trust or its Representatives and a responsible representative of the Contractor prior to submittal of the Contract records.

3.1.1.1 Final As-Built Drawings

Within 30 calendar days of substantial completion the Contractor shall submit final as-built drawings. The Final As-built Drawings shall reflect the Record Survey data collected in accordance with Section 01720 FIELD SURVEYING. All drawings from the original Construction Drawings set shall be included, including the drawings where no changes were made. The Trust Representative will review all final as-built drawings for accuracy. The drawings will be returned to the Contractor if corrections are necessary. Within 10 calendar days the Contractor shall revise the drawings accordingly, at no additional cost, and return the drawings to the Trust Representative for approval. Paper prints, drawing files and storage media submitted will become the property of the Trust upon final approval.

-- End of Section --

SECTION 01782

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, materials, and incidentals required to prepare and update the project records and closeout report to produce an end product which complies with the contract requirements

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health (OSHA) Standards

29 CFR 1926 Safety and Health Regulations for Construction

1.3 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

Project Records; T

The Contractor shall maintain all construction documents as required and submit, upon request or upon completion of field operations, project documents to the Trust Representative including analytical and chemical quality control results in final report format, record survey, as-built drawings, records, and correspondence.

Closure Report; T

The Contractor shall submit a draft of the Closure Report to the Trust Representative for approval within 30 calendar days of substantial completion. The draft report shall contain a copy of the Record Survey in accordance with Section 01720 Field Surveying and a complete set of As-built Drawings in accordance with Section 01781 AS BUILT RECORDS AND DRAWINGS.

The Contractor shall submit the final Closure Report within 15 calendar days of receipt of Trust Representative review comments. The final report shall contain a copy of the Record Survey in accordance with Section 01720 Field Surveying and a complete set of As-built Drawings in accordance with Section 01781 AS BUILT RECORDS AND DRAWINGS.

1.4 PROJECT RECORDS

The Contractor shall maintain at the Contractor's field office one record copy and scope of work; modifications to the contract and technical requirements of the work; Trust Representative's or Trust directives; and written reports of any significant quality assurance problems. The Contractor shall maintain an activity summary file for each property that shall include: Photographs; Reports on emergency response actions/spill incidents; Records of all site work; Chain-of-custody documents; All laboratory analytical results; All safety and accident reports; Air monitoring reports and data; Construction quality control daily reports; Chemical quality control reports; Cost information.

1.4.1 Maintenance of Documents

All project record and backup documents shall be stored and managed by the Contractor. The Contractor shall store the documents in the Contractor's field office apart from current working documents. The Contractor shall maintain documents in a clean, dry legible condition and in good order, and not use record documents for work purposes. The Contractor shall maintain all current records; and make those documents available at all times for inspection by the Trust Representative.

1.5 CLOSEOUT SUBMITTALS

1.5.1 As-Built Field Data Documentation

The Contractor shall prepare and submit as-built records in accordance with Section 01781 AS BUILT RECORDS AND DRAWINGS.

1.5.2 Closure Report

A Closure Report shall be prepared by the Contractor covering all remediation and restoration actions. The Closure Report shall provide adequate detail to describe and document all activities conducted on each specific project including boundaries of excavation, excavation and backfill volumes, materials placement, documentation of health and safety, sample results for materials brought onto site, problems encountered, material disposal, air monitoring results, and progress photographs.

1.6 RECORD KEEPING

The following logs, reports and records shall be developed, retained and submitted to the Trust Representative and/or entitled regulatory agencies upon request (unless otherwise noted in previous sections):

- a. Training logs including employees' printed names and signatures in addition to training subject and date or copy of applicable training certificate;
- b. Daily safety inspection logs;
- c. Employee/visitor register;
- d. Medical opinions/certifications;

- e. Environmental and personal exposure monitoring records; Phase-out reports (final decontamination verification certificates, final medical certificates, etc.); and,
- f. A copy of all State licensing certificates required to conduct all required activities; and,
- g. Local labor participation; Monthly summary reports showing average utilization by the hour for local labor compared to total utilization for the payment period with a % local labor used determination.

All personnel exposure and medical monitoring records shall be maintained in accordance with applicable OSHA standards, 29 CFR 1910 and 29 CFR 1926 (including OSHA 200 log and accident/first aid reports).

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

-- End of Section --

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SECTION 01785

WARRANTY OF CONSTRUCTION

PART 1 GENERAL

(NOT USED)

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 WARRANTY OF CONSTRUCTION

In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

This warranty shall continue for a period of 1 year from the date of final acceptance of the Work. If the Trust takes possession of any part of the Work before final acceptance, this warranty shall continue for a period of 1 year from the date the Trust takes possession.

The Contractor shall remedy at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to Trust-owned or controlled real or personal property, when that damage is the result of:

- a. The Contractor's failure to conform to contract requirements or
- b. Any defect of equipment, material, workmanship, or design furnished.

The Contractor shall restore any work damaged in fulfilling the warranty. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

The Trust or its representatives will notify the Contractor, in writing or by telephone, after the discovery of any failure, defect, or damage.

If the Contractor fails to remedy any failure, defect, or damage within 5 working days after receipt of notice, the Trust will have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:

- a. Obtain all warranties that would be given in normal commercial practice;

- b. Require all warranties to be executed, in writing, for the benefit of the Trust, if directed by the Trust Representative; and
- c. Enforce all warranties for the benefit of the Trust, if directed by the Trust Representative.

In the event the Contractor's warranty has expired, the Trust may bring suit at its expense to enforce a subcontractor's, manufacturer's or supplier's warranty.

Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Trust nor for the repair of any damage that results from any defect in Trust-furnished material or design.

This warranty shall not limit the Trust's rights under the contract with respect to latent defects, gross mistakes, or fraud.

-- End of Section --

SECTION 01800

ROAD MAINTENANCE AND DUST CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

Grade and maintain access roads and drainage ditches on all roads designated by the Trust Representative within the project areas as described in the Technical Specifications and Construction Drawings.

Apply water as needed to control dust from construction traffic within the project areas as shown on the Construction Drawings.

PART 2 PRODUCTS

2.1 WATER

Water used for dust suppression may be obtained from locations shown in the Construction Drawings or as directed by the Trust Representative.

PART 3 EXECUTION

3.1 WATER APPLICATION

Water shall be applied to roads or other site areas requiring dust control via water truck at a rate and frequency that controls all visible dust and does not produce sheet flow and/or erode existing features. Water applications shall be provided by the Contractor during the course of work on an as-needed basis or as directed by Trust Representative.

3.2 ROAD MAINTENANCE

Regrade, repair and or resurface all roads which receive project related traffic within the project areas as described in the Technical Specifications and Construction Drawings, or as directed by the Trust Representative.

Regrade road using appropriately sized grader or as directed by Trust Representative.

Provide and apply water to the road as required for regrading and fugitive dust control purposes and as directed by Trust Representative.

-- End of Section --

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ISPWC SITE SPECIFIC TECHNICAL SPECIFICATIONS

The Site Specific Technical Specifications constitute amendments and additions to the Idaho Standards for Public Works Construction (ISPWC) which is referred to by basic designation only. Precedence shall be determined according to the provisions of Article 3 of the standard General Conditions.

Change all references made to the “Owner” to read the “Coeur d’Alene Trust”, the Successor Coeur d’Alene Custodial and Work Trust. References made to the “Engineer” are modified to read the “Design Engineer” or the “Trust Representative.” The Trust Representative is equivalent to the “Owner’s Representative” consistent with the roles defined in the standard General Conditions.

Division 200: Earthwork

Section 201 – Clearing and Grubbing and Removal of Obstructions

Add to Paragraph 3.1.B.1 as follows:

“Contaminated material shall be disposed of at an approved cleanup repository specific to the project.”

Add to Paragraph 3.1.B.6 as follows:

“...all Federal, State, ICP and Local Regulations.”

Add to Paragraph 3.1.C.1 as follows:

“...acceptable to Federal, State, ICP and Local Regulations.”

Add paragraph 3.2.A.5 as follows:

“5. Locate and protect all manhole covers, valve boxes, catch basins, and any other existing surface feature.”

Add to Paragraph 3.2.B.3 as follows:

“....all local, state, ICP and federal regulations”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 202 – Excavation and Embankment

Delete Paragraph 1.4.A.

Add or modify Paragraph 3.2.B.5 as follows:

“...in compliance with Federal, State, ICP and Local rules for disposal. Contaminated material shall be hauled to an approved cleanup repository specific to the project”

Delete Sub-Section 3.3 Controlled Blasting

Add Paragraph 3.6.E as follows:

E. All surface runoff from the exposed subgrade shall be managed per the EPP (01355) in compliance with the ICP. It is the Contractor’s responsibility to meet all ICP requirements.

Change Paragraph 3.7.B as follows:

“Dispose of unsuitable material at an approved cleanup repository specific to the project.”

Add Paragraph 3.11.I to read as follows:

“A final dust abatement product (magnesium chloride) shall be applied to new gravel road surfaces. The product and application methods shall adhere to Section 307 of the Site Specific Technical Specifications.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 204 – Structural Excavation and Compacting Backfill

Modify Paragraph 3.2.B.6 as follows:

“Where a footing, drainage structure foundation, or trench bedding and foundation material is to be placed, take care not to destroy the bearing value of the native soil. Structure foundations and foundation material to be placed beneath a structure or pipe shall be placed on native, undisturbed soil and compacted to a minimum 95% according to the modified proctor”

Modify Paragraph 3.3.B.3 as follows:

“...and elevations with suitable native material or Type-2 Crushed Aggregate compacted in max. 8” lifts as specified in Section 306.”

Modify Paragraph 3.4.E.1.a as follows:

“Horizontal Location: Test at the start of the trench and at a rate of one test per maximum of every 200 feet. Test a minimum of 2 locations equal distance apart for trenches less than 200 linear feet. Provide a minimum of one test for each culvert location.”

Delete Paragraph 3.4.E.2. Linear foundations are not applicable to this project.

Modify Paragraph 3.4.E.3.a as follows:

“...backfill surface area. Backfill around drainage structures shall be tested at a minimum of two locations on opposite sides of the structure. Alternate sides tested after each lift.”

Delete Part 4, Measurement and payment. Measurement and payment is incidental to other bid items.

Section 205 – Dewatering

Add Paragraph 3.1.B as follows:

“B. Include coffer dams, pumps, and bypass piping where work is to be performed in live channels or ponds.”

Add Paragraph 3.1.C as follows:

“C. Infiltration areas constructed onsite to manage the discharged water pumped from excavations shall be restored to their original condition and include a 12” cap constructed per the ICP. The location of infiltration areas shall be approved by the Panhandle Health District, Coeur d’Alene Trust, and the local jurisdiction prior to construction. All cost associated with the management of water from excavations shall be included in this bid item.”

Add to Paragraph 3.2.A. as follows:

“...water quality standards, ICP, and agreements...”

Add to Paragraph 3.2.A as follows:

“Water will not be discharged to a cleanup repository or to offsite drainage facilities without prior written approval...”

Revise Paragraph 3.4.B. as follows:

“...notify Coeur d’Alene Trust immediately upon encountering ...”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 206 – Permanent Erosion Control

Revise Section 2.4 as follows:

2.4 TOPSOIL

- A. All soil imported for project purposes shall conform to Section 01450 of the Specifications, with analytical sampling performed according to the provisions of the QAPP, and shall be verified clean in accordance with the Specifications prior to import to the project.

Revise Paragraph 2.7.A as follows:

“Riprap will be classified as loose riprap. Material to be durable, angular field or quarry stones of approved quality, sound, hard, free from seams or other structural defects from an approved source. Material to be uniformly placed ...”

Add Paragraph 2.7.B.3 as follows:

Loose riprap shall meet the following gradation requirements:

Sieve Size	% Passing
12 inch	100
10 inch	85
8 inch	50
4 inch	15

Outlet armoring shall meet the following gradation requirements:

Sieve Size	% Passing
24 inch	100
18 inch	85
12 inch	50
6 inch	15

Boulders for rock weirs shall be constructed from those larger rocks taken from outlet armoring.

Delete Paragraphs 2.7.C, 2.7.D, and 2.7.E.

Add the following to Section 3.1:

Hydroseed mix shall provide a slurry for an even application over the entire area to be hydroseeded. Hydroseed mix guidelines are provided below. Apply water as necessary to support growth of hydroseed for 45 calendar days following completion of seeding.

Hydroseed Guidelines Per Tank Load:

- Primary Grass Seed – Premium, duraturf, ecoturf, or specialty (i.e. clover mix) = 80 lbs
 - Annual Ryegrass = 15 lbs
 - Mulch – Enviroblend, 70 wood:30 paper 3 bags (150 lbs), Hydrostraw, 80% straw 3 bags (150 lbs) = 300 lbs
 - Fertilizer NPK 10-20-20+6 MgO = 80 lbs
 - Tackifier = 60 oz
 - Water = 800 gal
- Quantities are based on 2000 lbs mulch, 400 lbs fertilizer, and 345 lbs seed/acre. Enviroblend may be reduced if thinner material is required.*

To ensure proper placement and growth of seed, the following procedure should be used in association with mixing and loading recommendations for hydroseed. After starting and warming machine engine, fill tank with water. Purge spray tower, hoses, and recirculation lines should be flushed with clean water at start of initial work period. Once material residuals have been removed, load seed, mulch, fertilizer, and tackifier into the slurry tank per mixing specifications presented above to produce a homogeneous slurry. Engage agitator to full forward position to achieve sufficient mixing of slurry.

Delete Sub-Sections 2.7.C, 2.7.D, and 2.7.E. Where specified, bank stabilization and armoring for erosion control shall be performed using “loose riprap”.

Add the following to Section 3.1.C.1

Seeding shall be Class D in all channels and in locations requested by Engineer. All other disturbed areas shall be Hydroseeded.

Replace Paragraph 3.1.C.2 with the following seed mixes:

Riparian seed should be applied within the riparian zone. The riparian seed mix shall consist of the species listed in Table 1, and be applied at a rate of 88 lbs per acre. As many species as possible should be incorporated into the seed mix.

Table 1. Riparian Zone Seed Species

Common Name	Species Name
Big-leaf sedge	<i>Carex amplifolia</i>
Water sedge	<i>Carex aquatilis</i>
Lens sedge	<i>Carex lenticularis</i>
Small-winged sedge	<i>Carex microptera</i>
Nebraska sedge	<i>Carex nebrascensis</i>
Sawbeaked sedge	<i>Carex stipata</i>
Beaked sedge	<i>Carex utriculata</i>
Inflated sedge	<i>Carex vesicaria</i>
Creeping spikerush	<i>Eleocharis palustris</i>
Coville's rush	<i>Juncus covillei</i>
Common rush	<i>Juncus effusus</i>
Dagger-leaf rush	<i>Juncus ensifolius</i>
Slender rush	<i>Juncus tenuis</i>
Hardstem bulrush	<i>Schoenoplectus acutus</i>
Woolgrass	<i>Schoenoplectus cyperinus</i>

Work required under this Bid Item includes seeding operations of all Riparian, Bank, and Upland areas, as indicated on the Contract Drawings and specified herein. Native seed shall be thoroughly mixed and combined with mulch and applied hydraulically.

Seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. All seed shall be certified weed-free and labels shall be in conformance with AMS Seed Act and applicable State seed laws.

Native seed mix for Bank and Upland areas is shown in Table 2, including appropriate proportions by weight. Variations to these mixtures may be used with prior approval by Trust. As many species as possible should be incorporated into the seed mix. Contractor shall apply native seed at a rate of 2 pounds per 1000 square feet (88 pounds per acre).

Table 2. Native Seed Mixture for Bank and Upland Areas

Common Name	Species Name	Required Percentage	
		Min	Max
Western Yarrow	<i>Achillea millefolium</i>	0%	20%
Red Baneberry	<i>Actaea rubra</i>	0%	20%
Pearly Everlasting	<i>Anaphalis margaritacea</i>	0%	10%
Rocky Mountain Columbine	<i>Aquilegia caerulea</i>	0%	20%
Red Columbine	<i>Aquilegia formosa</i>	0%	20%
Mountain Brome	<i>Bromus marginatus</i>	0%	30%
Tufted Hairgrass	<i>Deschampsia caespitosa</i>	20%	30%
Blue Wildrye	<i>Elymus glaucus</i>	0%	30%
Idaho Fescue	<i>Festuca idahoensis</i>	20%	30%
Blanketflower	<i>Gaillardia aristata</i>	0%	30%
Big Leaf Lupine	<i>Lupinus polyphyllus</i>	0%	30%
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>	15%	30%
Black-eyed Susan	<i>Rudbeckia hirta</i>	0%	30%
Cutleaf Coneflower	<i>Rudbeckia laciniata</i>	0%	30%

Revise Paragraph 3.2.A as follows:

“...blanket used shall be Double Net 100% Coconut Western Excelsior Excel CC-4 Natural or approved equal.”

Delete Sub-Sections 3.3A, 3.3C, 3.3D, and 3.3E. Where specified, bank stabilization and other armoring shall be performed using “loose riprap”.

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 300: Trenching

Section 301 – Trench Excavation

Add to Paragraph 2.1.B as follows:

“...and fitness for the work. Excavated material stockpiled alongside of the trench to be used for backfill shall not be left overnight without prior approval. All surfaces shall be cleaned as required by the ICP once the material is backfilled. At a minimum, remnants of the backfill stockpiles shall be swept and hosed back into the trench.”

Modify Paragraph 3.5.A as follows:

“Survey line and grade control hubs will be set by Contractor using survey control hubs shown on the Contract Drawings in a manner consistent...”

Modify Paragraph 3.5.B as follows:

“Provide the Coeur d’Alene Trust two (2) working days notice...”

Modify Paragraph 3.5.C as follows:

“Stakes and markers damaged by the Contractor will be replaced by the Contractor at the Contractor’s expense.”

Delete Section 3.6 Irrigation Ditches.

Add to Paragraph 3.13.C as follows:

“...Disposal cost to a cleanup repository is incidental to the contract. Once the stockpiled material has been used for backfill or hauled offsite, all surfaces where it was stored shall be cleaned up as required by the ICP. At a minimum, remnants of the backfill stockpiles shall be swept and hosed back into the trench.”

Add Section 3.13.E as follows:

“E. Any remediated area in the right-of-way or on private property contaminated during construction due to tracking or the placement or stockpiling of excavated material shall be remediated according to ICP requirements at the Contractor’s expense.”

Delete Section 3.14 Tunneling.

Add to Paragraph 3.15.C as follows:

“...water quality standards, ICP, and agreements...”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 303 – Exploratory Excavation

Modify Paragraph 1.5.B as follows:

“Contractor shall verify existing utility locations and depths once uncovered. Contractor shall provide all necessary shoring and other trench and pit safety requirements as set forth by OSHA. Allow 48 hours for the Engineer to modify the design, if necessary, as a result of conflicting utility conditions.”

Add Paragraph 2.2.E as follows:

“E. All equipment shall be decontaminated per the Specifications and in compliance with the ICP prior to demobilizing.”

Add to Paragraph 3.1.E as follows:

“Excavation, backfill, and restore surfacing shall be in accordance with applicable sections of the Technical Specifications. Disposal and haul cost to a cleanup repository is incidental to the contract. Once the excavated material has been used for backfill or hauled offsite, all surfaces where it was stored shall be cleaned as required by the ICP. At a minimum, remnants of the stockpiles shall be swept and hosed back into the exploratory pit.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 304 – Trench Foundation Stabilization

Modify Paragraph 1.4.A to specify:

“Submit current sieve analysis for gradation review of the material to be used for stabilization.”

Add Paragraph 2.1.D. as follows:

“Measurement and payment for Trench Foundation stabilization, if necessary, shall be incidental to Bid Item 306.4.1.A.1 (Type “A” Trench Backfill for Storm Drain Piping).”

Modify Paragraph 2.3.A as follows:

“Field inspections during construction will be performed by the Trust’s Representative. Testing will be performed by a pre-approved, qualified entity. Quality control testing is incidental to the pay item, paid for by the Contractor. The Coeur d’Alene Trust shall review the test results.”

Delete Part 4, Measurement and payment. Measurement and payment for foundation stabilization material and labor shall be incidental to Bid Item 306.4.1.A.1 (Type “A” Trench Backfill for Storm Drain Piping).”

Section 305 – Pipe Bedding

Modify Paragraph 1.1A as follows:

“Pipe bedding placement and compaction.”

Modify Paragraph 1.4.A to specify:

“Submit current sieve analysis for gradation review of the material to be used for bedding.”

Delete Sections 2.4 and 2.5. Type III and Type IV Bedding material is not specified for this project.

Delete Sections 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8. A Class A-1 Bedding system is specified for this project.

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 306 – Trench Backfill

Modify Paragraph 1.4.A to specify:

“Submit current sieve analysis for gradation review of the imported material to be used for backfill.”

Add to Paragraph 1.4.A to specify:

“...requirements of the Contract Documents and Clean Soil criteria as required in the ICP.”

Delete Section 2.2 Native Trench Backfill Material.

Strike Paragraph 2.3.A and change to specify...

Native trench material shall not be used, use imported material for all trench backfill. Imported backfill material shall conform to Section 802 – Crushed Aggregates. Type 2 crushed aggregate backfill shall meet the following gradation requirements:

Sieve Size	% Passing
2-1/2”	100
2”	90 – 100
1”	55 – 83
No. 4	30 – 60
No. 30	18 – 25
No. 200	0 – 8

Delete Section 2.4 Fractured Rock Backfill.

Modify Paragraph 3.4.D.2 as follows:

“Place top soil to a minimum depth of 12” as indicated on the Remediation Plans. The top soil shall meet the metals content criteria as specified in Section 307 – Street Cuts and Surface Repairs.”

Delete Section 3.5 Fractured Rock Backfill

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 307 – Street Cuts and Surface Repairs

Modify Paragraph 1.1.A. as follows:

“Section includes replacement and repair of pavement, curbs, gutters, cross drains, sidewalks, road shoulders, gravel shoulders, gravel roadways, driveways, landscaped areas, and similar items due to trenching operations and other surface reconstruction as indicated in the Contract Drawings.”

Add the following to Part 2 – Materials

“All soil and aggregate materials furnished for surface repair, except for ballast used in paved roadways, shall meet the requirements of Section 01450 of the Specifications.

Material furnished for bedding, trench backfill, and ballast for paved (Type “P”) roadway sections do not require metals analysis.

Where required to separate clean backfill material from contaminated materials in the subgrade, visual barrier fabric (geotextile fabric) shall meet the following requirements:

Property/Test Method	Minimum Performance
Grab Tensile Strength (ASTM D4632)	200 lbs.
Grab Tensile Elongation (ASTM D4632)	15/10 (%MD/CD)
UV Resistance after 500 hours (ASTM D4355)	70%
Apparent Opening Size (ASTM D4751)	0.425mm (#40 sieve) or larger
Permittivity (ASTM 4491)	0.05 sec ⁻¹

The visual barrier fabric shall be incidental to pay items for surface restoration.”

Add Paragraph 3.1.G as follows:

“G. Installation of geotextile fabric is required per ICP requirements between the imported material and the subgrade for Type “C”, Type “M”, and riprap surface restoration.”

Modify Paragraph 3.3.A as follows:

“Prior to beginning construction, walk area with the Trust Representative to identify...”

Modify Paragraph 3.3.B as follows:

“As a part of pavement restoration construction, if directed by Trust, remove pavement in soft spot areas and remove roadway base materials to depth direct by Trust Representative.”

Modify Paragraph 3.3.C as follows:

“Compact subgrade and place crushed aggregate base as directed by Trust Representative and in accordance with Street Cuts and Surface Restoration/Remediation Details in the Contract Drawings.”

Add Paragraph 3.5.C as follows:

“C. Install miscellaneous surface restoration in areas as designated in the Contract Drawings and any disturbed area as a result of construction activity.”

Modify Paragraph 3.6.B as follows:

“Construct per Street Cuts and Surface Restoration/Remediation Details in the Contract Drawings”

Modify Paragraph 3.7.B as follows:

“Construct per Street Cuts and Surface Restoration/Remediation Details in the Contract Drawings”

Modify Paragraph 3.7.C as follows:

“Use 8 inches of compacted ballast and 4 inches of compacted gravel...”

Add Paragraph 3.7.G as follows:

“G. Install geotextile fabric between the ballast and existing subgrade.”

Add the following under Section 3.7

Gravel roadway surfaces replaced under Type “C” Surface Restoration shall be treated with a final dust abatement product. Once the crushed aggregate road surface has been installed, approved compacted, and to final grade, the surface shall be treated with magnesium chloride dust abatement. The product shall be uniformly applied to the finished surface at optimum moisture content using a computerized truck applicator. The product shall be applied in two passes at a rate of 0.25 gallons per square yard (0.50 gal/sy total).

The final dust abatement product shall conform to the following mixture:

Component	Portion (%)
Magnesium Chloride	30 – 33
Sulfate	1.0 – 4.0
Nitrate	0.1 – 0.5
Water	62 – 70

Modify Paragraph 3.8.B as follows:

“Construct per Street Cuts and Surface Restoration/Remediation Details in the Contract Drawings and Section 810 – Plant Mix Pavement.”

Modify Paragraph 3.8.C as follows:

“Use 8 inches of compacted ballast and 4 inches of compacted base course...”

Delete Section 3.9 Type “P” Surface Restoration with Fabric.

Modify Paragraph 3.10.A as follows:

“Construct per Street Cuts and Surface Restoration/Remediation Details in the Contract Drawings and Section 810 – Plant Mix Pavement.”

Delete Section 3.11 Modified Full Width Pavement Surface Restoration

Modify Paragraph 3.12.C.1 as follows:

“...and to existing condition. At a minimum, any disturbed areas shall be restored to meet remediation requirements set forth by the ICP.”

Modify Paragraph 3.12.C.2 as follows:

“The depth of gravel shoulders shall conform to the Contract Drawings. Restoration of disturbed gravel shoulders shall be remediated to meet ICP requirements.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 400: Water

Section 401 – Water Pipe and Fittings

Modify Section 2.2 as follows:

Water main piping installed shall be Corrugated HDPE conforming to Section 2.2.A, unless otherwise specified. Pipe fittings shall be ductile iron conforming to Sections 2.2.D and 2.3, unless otherwise specified by the Design Engineer.

Add to Section 3.4.D as follows:

“...thrust block and fitting. All fittings, valves, saddles, and areas which include bolted connections shall be wrapped in 6 mil polyethylene prior to placement of concrete thrust block.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 600: Culverts, Storm Drains and Gravity Irrigation

Section 601 – Culverts, Storm Drains and Gravity Irrigation

Modify Section 2.2 as follows:

Corrugated High Density Polyethylene (CHDPE) storm drain pipe shall meet requirements set forth in Section 2.2.G. The CHDPE shall be Type S, with a smooth interior liner. In addition, the CHDPE shall meet or exceed recommendations set for by ASTM F2306. Joints shall meet ASTM F477 gasket and ASTM F2487 water tight requirements for low-head pressure pipe.

Polypropylene pipe shall be ADS or equivalent that shall meet the requirements in Section 2.2.M.

The piping shall support H-25 loads at the design installation depths and shall be installed per the Manufacturer's specifications, in addition to those outlined in Section 3.2.

Add to Paragraph 3.1.A as follows:

“...meets the requirements of Section 405 – Non-Potable Water Line Separation, and as detailed in the Contract Drawings.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 602 – Storm Drain Inlets, Catch Basins, Manholes and Gravity Irrigation Structures

Modify Section 2.2 as follows:

Manhole bases, risers, and tops for this project shall be precast conforming to Section 2.2.A, unless otherwise specified, and conform to the details provided in the Contract Drawings.

Inlets and catch basins for this project shall be precast conforming to Section 2.2.B and the details provided in the Contract Drawings.

Add section 2.12 as follows:

“2.12 Fittings

A. Fittings shall be composed of materials compatible with polypropylene pipe as

recommended by pipe manufacturer (ADS or equivalent).”

Add to Paragraph 3.2.A. as follows:

“...subgrade as specified in Section 305 – Pipe Bedding, unless otherwise specified on the Contract Drawings. Extend bedding...”

Modify Paragraph 3.3.C as follows:

“C. For CHDPE profile pipe or other pipe with undular exterior, provide transition to smooth wall pipe prior to manhole or other approved water tight connection.”

Add Paragraph 3.3.D as follows:

“D. All manhole connection fittings installed on storm trunk line where pipe slopes exceed 12% shall be installed per manufacturer’s (ADS or equivalent) guidelines.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 700: Concrete

Section 703 – Cast-in-place Concrete

Modify Paragraph 2.4.I as follows:

“Flowable Fill (CDF) shall be 3000psi concrete mix with a cement content of 300 lb/cy. The max water to cement ratio shall be 2.0, and the slump shall be 6-8 inches. Use 3,200 lbs of (SSD) aggregates per cubic yard with a blend of 70% fine aggregate and 30% coarse aggregate (3/8 inch to No. 4) per ASTM C33.”

Delete Part 4, Measurement and payment. Measurement and payment is considered incidental to other bid items. No separate payment will be made for items outlined in this section.

Section 704 – Precast Concrete

Add to Paragraph 1.4.A. as follows:

“...applicable code specified loads. Precast structures and appurtenances shall be designed for an H-25 load.”

Modify Paragraph 1.5.A. as follows:

“...registered in the State of Idaho. Shop drawings for the precast structures shall be stamped and signed by an Idaho licensed engineer qualified to design concrete structures. The shop drawings and calculations shall be submitted to the Coeur d’Alene Trust for

review prior to use pending written approval to comply with this section. The type of concrete used and required testing for the precast structures shall conform to that as specified in the shop drawings prepared by the structural designer. The cost for engineered shop drawings is incidental to the corresponding bid item the shop drawings are prepared for.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 800: Aggregates and Asphalt

Section 802 – Crushed Aggregates

Add the following to Paragraph 2.2:

Base Rock used for roadway and gravel surface restoration shall meet the requirements of Type I Crushed Aggregate. Ballast used for roadway surface restoration shall be 3-inch minus aggregate meeting the following gradation:

Sieve Size	% Passing
6 inch	100
3 inch	98-100
2 inch	75-100
1 inch	40-80
No.4	25-60
No. 200	5-12

Delete Part 4, Measurement and payment. Crushed aggregates are incidental to other pay items.

Section 803 – Plant Mix Aggregates

Delete Part 4. Plant mix aggregates are incidental to Pay Items for Surface Restoration.

Section 805 – Asphalt

Add to Section 2.1.B as follows:

“The performance grade asphalt binder shall be PG 58-28.”

Delete Part 4. Asphalt is incidental to Pay Item for Surface Restoration.

Section 806 – Asphalt Tack Coat

Delete Part 4. Asphalt tack is incidental to Pay Item for Surface Restoration.

Section 810 – Plant Mix Pavement

Add to Section 2.1.A. as follows:

“All plant mix pavement shall be Class III”

Delete Section 2.1.D

Revise Paragraph 2.3.A.1 as follows:

“Asphalt performance grade for this project shall be PG 58-28”

Delete Part 4, Measurement and payment. Plant Mix Pavement is incidental to Surface Restoration.

Division 1000: Construction Stormwater Best Management Practices (BMPs)

Section 1001 – Construction Site Management

Change Paragraph 1.4.A. as follows:

An Operator of the stormwater and erosion control system shall be designated by the Contractor consistent with Section 01355 of the Coeur d’Alene Trust Base Specifications. The Operator shall ensure that the stormwater and erosion control BMPs are installed and functioning as indicated on the Contract Drawings. The Contractor shall inspect and maintain the BMPs as specified. Additional BMPs shall be installed by the Contractor as needed to prevent erosion and sediment transport.

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 1003 – Sediment Collection

Delete Paragraphs 1.4.A and 1.4.B.

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 1100: Traffic

Section 1103 – Construction Traffic Control

Change Paragraph 2.1.A. as follows:

“...will be at the Contractor’s option, but must comply with the MUTCD.”

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Division 2000: Miscellaneous

Section 2010 – Mobilization

Delete Section 1.1.A.6 Work Signs.

Delete Part 2 and Paragraph 3.1.A. Work signs are not required for this project.

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 2020 – Survey Monuments

Delete Part 4. All labor, equipment and materials required to follow that specified in Section 2020, Survey Monuments, is incidental to other bid items.

Section 2030 – Utility Adjustments

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Section 2050 – Construction Geotextiles

Delete Part 4, Measurement and payment. Measurement and payment shall be as specified in Part I of the Contract Documents.

Appendix G
Operations and Maintenance Manual

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OPERATION AND MAINTENANCE MANUAL

GEM DRAINAGE REMEDY PROTECTION PROJECT Shoshone County, Idaho

Prepared for:



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and

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May, 2019

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**OPERATION AND MAINTENANCE MANUAL
GEM DRAINAGE REMEDY PROTECTION PROJECT
BUNKER HILL SUPERFUND SITE
May 28, 2019**

INTRODUCTION

The Gem Drainage Remedy Protection Project was implemented under an interagency cooperative agreement entered into by the State of Idaho (State) and Shoshone County (County). Pursuant to that agreement, Shoshone County are responsible for all Operation and Maintenance (O&M) activities for the system. This Manual provides requirements for scheduled and unscheduled long-term O&M of the remedial actions completed for the Gem Drainage Remedy Protection Project pursuant to the 2012 Interim Record of Decision (ROD) Amendment (USEPA, 2012). The objective of the Manual is to document the O&M actions that are necessary to preserve the integrity of the completed remedial actions. The O&M actions described herein are the minimum activities that must be performed by the County and owner for the life of the system to ensure that the system functions in accordance with the design intent.

This Manual provides forms and checklists that are intended to aid the County and owner with recording maintenance and repair activities. The Manual includes the following sections:

- Remedy Description
- Scheduled Operation and Maintenance Requirements
- Unscheduled Operation and Maintenance Requirements
- Repair Standards and Authorization
- Equipment and Personnel Requirements
- Refinements and Modifications
- Other Considerations.

REMEDY DESCRIPTION

As illustrated in Figure 1, the project is located northeast of the City of Wallace in Shoshone County, Idaho. The scope of this Manual is limited to the Gem Drainage Remedial Actions (Remedy) that were constructed to collect and convey drainage from an unnamed channel. An overview of the Gem Drainage Remedy Protection Project is provided in Figure 2. Remedial action components requiring specific action under this O&M Plan include:

- Gem Conveyance Pipe
Approximately 244 linear feet of 24-inch diameter Polypropylene pipe (PP) from the intake to MH-1, from MH-1 to MH-2, and MH-2 to the outfall
- Riprap Intake and Outfall Armoring
- Rock Weirs at inlet

Boulder weirs with Riprap armoring to protect inlet from scour.

- Manholes

Two manholes provide maintenance access to the new conveyance system

- Gem Conveyance Pipe Outfall

One pipe outfall to Canyon Creek

- Intake Structure

One concrete intake structure with a headwall and wingwalls installed to divert drainage into the new conveyance system

SCHEDULED OPERATION AND MAINTENANCE REQUIREMENTS

Scheduled O&M requirements are those activities completed at predetermined time frames throughout the year. Scheduled inspections will occur semi-annually; in early May, and September. The Inspection Criteria and Repair Guideline Chart in Appendix A summarizes specific criteria and necessary repairs for the design elements of the Gem Drainage Remedy Protection Project.

The criteria listed in Appendix A are to be used during the inspection in conjunction with the Inspection Checklist in Appendix B. The purpose of the inspection is to identify potential problems and trigger potential actions. The Inspection Checklist includes inspection triggers to aid the inspector in determining when a remedial action design element is not functioning as intended. The criteria and inspection triggers are not intended to be hard standards, but serve as a general guide for the inspector to identify items of concern. As discussed below, refinements and modifications to the criteria are anticipated.

UNSCHEDULED OPERATION AND MAINTENANCE REQUIREMENTS

Unscheduled operation and maintenance of the Gem Drainage Remedy Protection Project will include inspections driven by unique events and repair activities. Examples of unique events include:

- High precipitation or runoff events
- Seismic activity
- Fire
- Vandalism

High-precipitation events are defined as 2.3 inches of rain in 24 hours, which represents the 2-year storm event for the site. This is intended to serve only as a measurable trigger, as shorter duration events, e.g. 1 inch in 1 hour, may also require attention. The inspector should use judgment in observing site conditions and determining necessity of unscheduled inspections.

Inspection and repair activities for unscheduled events are similar to those listed in Appendices A and B, but may vary slightly depending on the event triggering the unscheduled inspection. In some cases, an unscheduled inspection may only be necessary for a single item (vandalism), while other events might require a full inspection of all elements (large flood). The inspection checklist in Appendix B can also be used for unscheduled inspections. The inspector should write “Not Inspected” under the notes column for any items not included in the inspection based on the nature of the triggering event.

If an event necessitates an unscheduled O&M activity, the County and owner may implement temporary or emergency actions to prevent further degradation. After the damaged area becomes stable, the entire area will be inspected and repaired as needed. The repair column of the table in Appendix A lists basic repair actions anticipated for the Gem Drainage Remedy Protection Project.

REPAIR STANDARDS & AUTHORIZATION

All repairs shall, at a minimum, conform and meet the specifications provided in the original design documents. The necessity and timing of all repairs will be coordinated by the County and owner.

EQUIPMENT AND PERSONNEL REQUIREMENTS

Inspectors shall be experienced with the O&M of stormwater collection and conveyance systems. Recommended equipment for completing inspections include a pickup truck, tape measure, flash light, manhole hook, and digital camera. Should no action be required, inspection and O&M activities will consist of the inspection only (i.e., no additional equipment or personnel shall be required). Repairs will be necessary if unacceptable items are found during the scheduled or unscheduled inspections. Repairs may require an excavator, pickup truck, dump truck, water truck, and/or vacuum truck. Repair personnel may include operators, engineers, and/or multiple laborers. Repair scheduling and sequencing shall be directed by the County and owner, implemented as soon as practicable, and completed in a fashion that minimizes costs.

REFINEMENTS AND MODIFICATIONS

Refinements and modifications to this manual may occur over time. Items that may require modifications to the manual include:

Change in Use of the Surrounding Areas

Anything that changes the flow of water from upstream areas should trigger reevaluation of the system and this manual. The design for the Gem Drainage Remedy Protection Project was based on existing conditions at the time of construction, with the assumption that any future land use changes would require stormwater detention or other runoff mitigation (Alta, 2019). If flow conditions are altered by changes upstream, the manual and remedy should be evaluated and modified appropriately to reflect the changes.

Expansion of the Gem Drainage Conveyance System

The County and owner may need to install catch basins or storm drain lines in the Gem Drainage project area as paved roads are rebuilt or as drainage patterns change with future development. Significant changes to the conveyance system must be evaluated in order to:

1. Verify that the system has adequate capacity to accommodate the proposed changes.
2. Verify that the changes preserve the goals and objectives of the original remedial action.
3. Verify that the changes are at least as protective as the original remedial action.
4. Specify requirements for follow-on inspection and maintenance (identify specific design elements and attributes, assign new action triggers, and suggested actions – see Appendix A) to maintain the changes.

Inspection Criteria

Refinements and modifications to the criteria utilized during inspections may be warranted based on long-term trends or patterns.

Equipment and Personnel

Changes may occur in the type and amount of repairs needed. The most efficient and cost effective substitutions for equipment and personnel shall be selected.

Repairs

If, during the course of completing repairs, the original specifications are found to be ineffective or unworkable, alternative repair standards shall be explored and assessed. The County and owner should refer to the project record drawings (MFA, 2019) for as-built information prior to constructing any repairs.

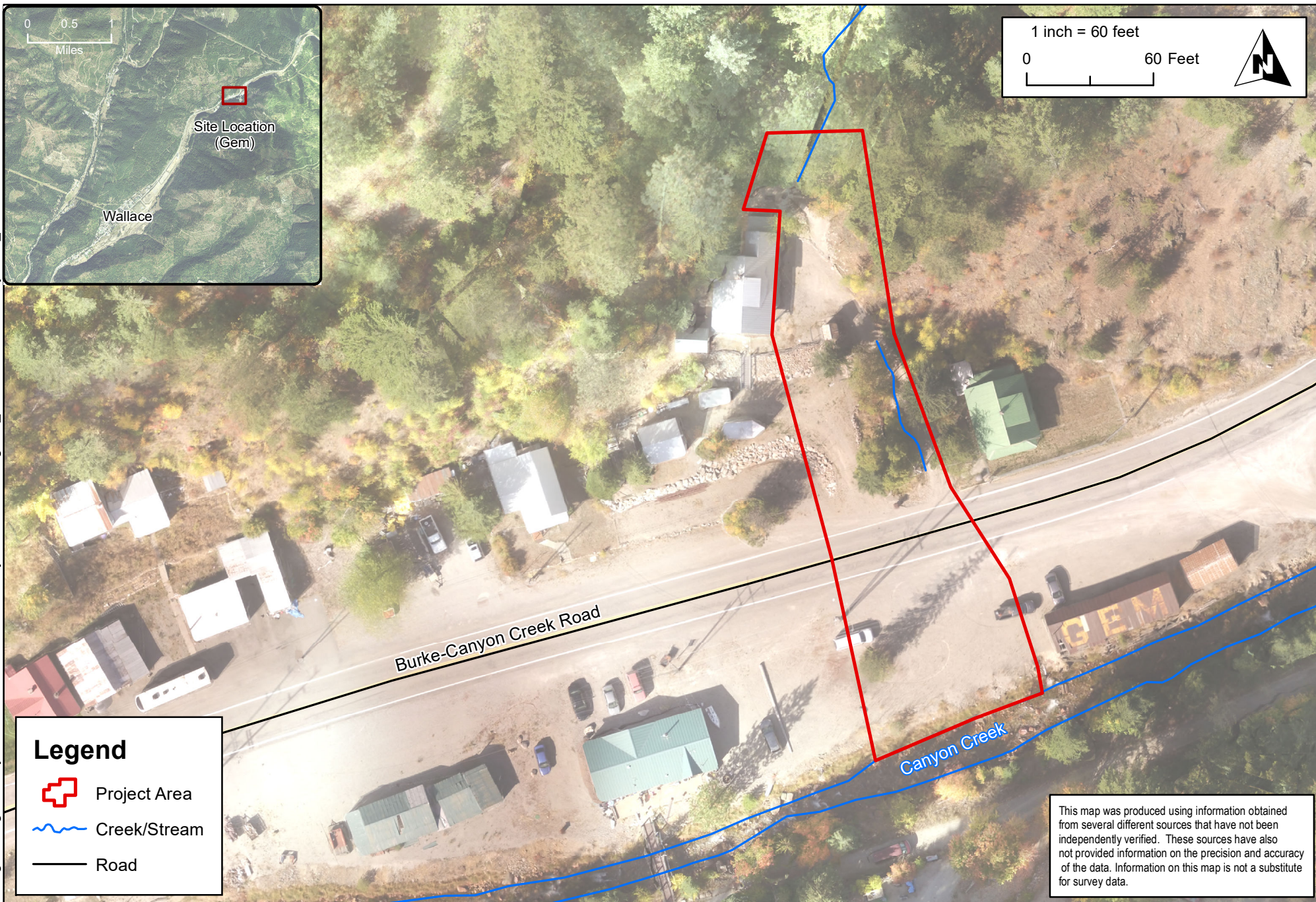
OTHER CONSIDERATIONS

Compliance with all applicable federal, state, and local (e.g., Institutional Controls Program) regulations is required during O&M activities.

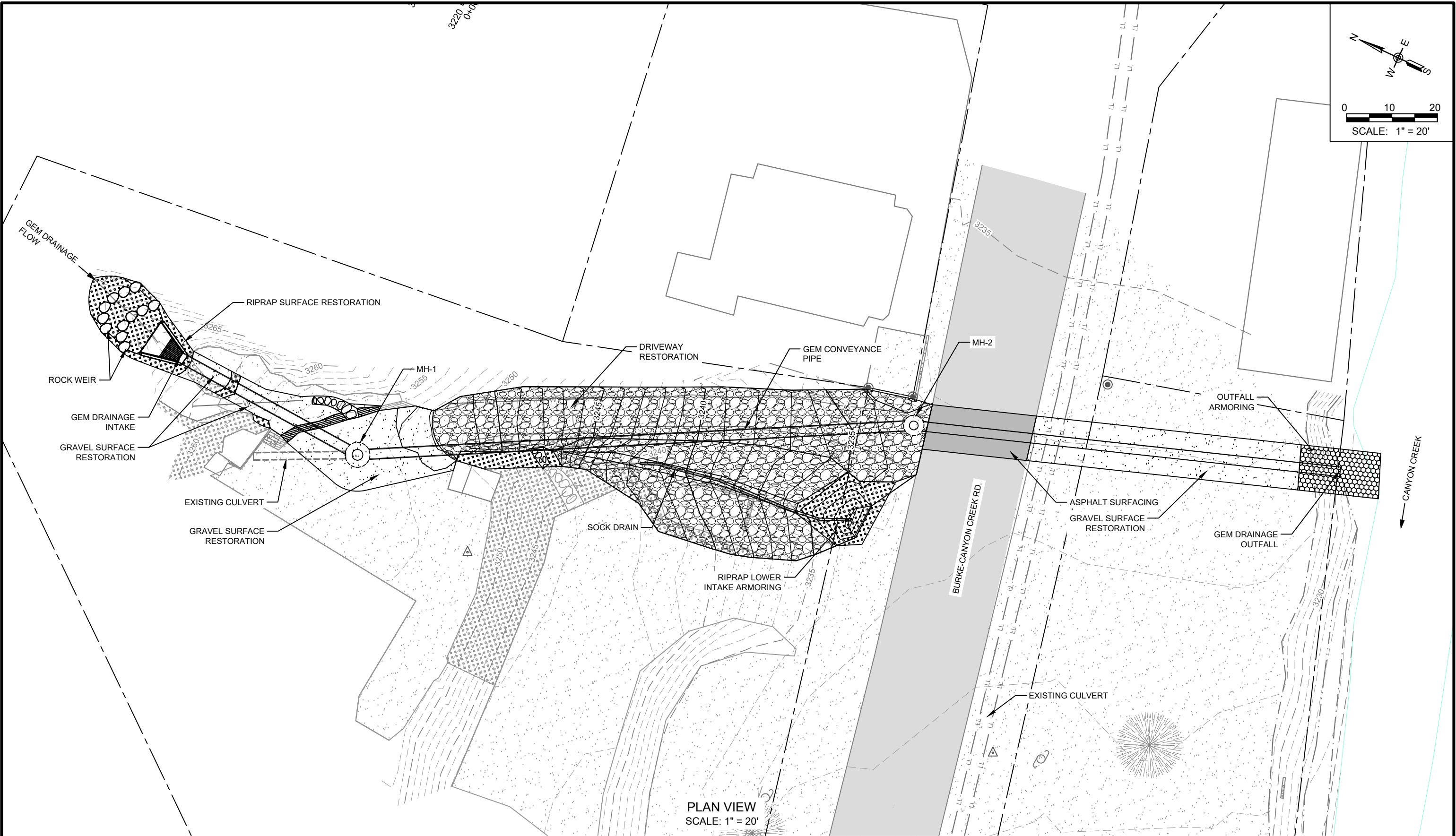
REFERENCES

- Maul, Foster & Alongi (MFA), 2019. Gem Drainage Remedy Protection Project Record Drawings (place holder).
- Alta Science & Engineering, Inc. (Alta) 2019. Bunker Hill Mining and Metallurgical Complex Superfund Site Operable Unit 3 Remedy Protection Gem Drainage Gem, Idaho Final Design Report. May.
- U. S. Environmental Protection Agency (USEPA), 2012. Interim Record of Decision (ROD) Amendment, Upper Basin of the Coeur d’Alene River, Bunker Hill Mining and Metallurgical Complex Operable Unit 3. August.

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NO.	DATE	REVISIONS	BY	CHK

DRAFTER:	R. SATICHTCHEV/D. PFEIFER
DESIGNER:	D. PFEIFER
CHECKED:	B. DAVIS
DATE:	04/02/2019

COORDINATE SYSTEM:	ISP WEST NAD83 NAVD88
SCALE:	1" = 20'
APPROVED:	D. FORSETH
DATE:	04/03/2019

GEM DRAINAGE REMEDY PROTECTION
GEM ID

PROJECT OVERVIEW

SHEET:	A1
DATE:	5/28/2019
PROJECT NO.:	19010-30-20
SHEET NO.:	1 OF 1

APPENDIX A: Inspection Criteria and Repair Guideline Chart

Appendix B: Inspection Checklist for Design Elements of Gem Drainage Remedy Protection Project

Date of Inspection:

Inspected By:

Design Element	Attribute	Inspection Triggers	Trigger Exceeded		Description Items Exceeding Inspection Trigger	Recommendation		
			Yes	No		No Action	Additional observation	Repair
Gem Conveyance Pipe	Conveyance	Evidence that flow may be obstructed based on observations in manholes or at pipe outlet.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riprap Intake Armoring (Road Side)	Deposition	Presence of debris, sediment, etc. such that flow is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Riprap Condition	Missing or out of place rock.	<input type="checkbox"/>	<input type="checkbox"/>				
	Erosion	Eroded area larger than 10 square feet or deeper than 6 inches.	<input type="checkbox"/>	<input type="checkbox"/>				
Manhole #1 (MH 1)	Structural Condition	Presence of holes, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the structure is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				
Manhole #2 (MH 2)	Structural Condition	Presence of holes, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the structure is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				
Gem Conveyance Pipe Outfall	Scour	Evidence of scour & erosion from high energy water near the outfall of the storm drain system.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Conveyance	Evidence that flow may be obstructed based on observations of pipe outlet	<input type="checkbox"/>	<input type="checkbox"/>				
		Structural damage reducing the cross sectional area of the pipe by more than 5%.	<input type="checkbox"/>	<input type="checkbox"/>				
	Structural Condition	Evidence of deteriorating culvert integrity such as abrasions, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>				
Intake Structure	Structural Condition	Presence of holes, cracks, or other defects in the structure or grate.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the inlet grate is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				
Rock Weir and Intake Armoring	Deposition	Presence of debris, sediment, etc. such that flow is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Riprap and Weir Condition	Missing or out of place rock.	<input type="checkbox"/>	<input type="checkbox"/>				
	Erosion	Eroded area larger than 10 square feet or deeper than 6 inches.	<input type="checkbox"/>	<input type="checkbox"/>				

Inspector Signature: Date:

***APPENDIX B: Inspection Checklist for the Gem Drainage Remedy
Protection Project***

Appendix B: Inspection Checklist for Design Elements of Gem Drainage Remedy Protection Project

Date of Inspection:

Inspected By:

Design Element	Attribute	Inspection Triggers	Trigger Exceeded		Description Items Exceeding Inspection Trigger	Recommendation		
			Yes	No		No Action	Additional observation	Repair
Gem Conveyance Pipe	Conveyance	Evidence that flow may be obstructed based on observations in manholes or at pipe outlet.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riprap Intake Armoring (Road Side)	Deposition	Presence of debris, sediment, etc. such that flow is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Riprap Condition	Missing or out of place rock.	<input type="checkbox"/>	<input type="checkbox"/>				
	Erosion	Eroded area larger than 10 square feet or deeper than 6 inches.	<input type="checkbox"/>	<input type="checkbox"/>				
Manhole #1 (MH 1)	Structural Condition	Presence of holes, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the structure is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				
Manhole #2 (MH 2)	Structural Condition	Presence of holes, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the structure is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				
Manhole #3 (MH 3)	Structural Condition	Presence of holes, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the structure is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				
Gem Conveyance Pipe Outfall	Scour	Evidence of scour & erosion from high energy water near the outfall of the storm drain system.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Conveyance	Evidence that flow may be obstructed based on observations of pipe outlet	<input type="checkbox"/>	<input type="checkbox"/>				
	Structural Condition	Structural damage reducing the cross sectional area of the pipe by more than 5%.	<input type="checkbox"/>	<input type="checkbox"/>				
		Evidence of deteriorating culvert integrity such as abrasions, cracks, or other structural defects.	<input type="checkbox"/>	<input type="checkbox"/>				
Intake Structure	Structural Condition	Presence of holes, cracks, or other defects in the structure or grate.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Evidence of water leaking into or out of the structure.	<input type="checkbox"/>	<input type="checkbox"/>				
	Deposition	Presence of debris or sediment such that flow through the inlet grate is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>				

Design Element	Attribute	Inspection Triggers	Trigger Exceeded		Description Items Exceeding Inspection Trigger	Recommendation		
			Yes	No		No Action	Additional observation	Repair
Rock Weir and Intake Armoring	Deposition	Presence of debris, sediment, etc. such that flow is obstructed.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Riprap and Weir Condition	Missing or out of place rock.	<input type="checkbox"/>	<input type="checkbox"/>				
	Erosion	Eroded area larger than 10 square feet or deeper than 6 inches.	<input type="checkbox"/>	<input type="checkbox"/>				

Inspector Signature: _____

Date: _____